

1-2-3
UPGRADES

DECEMBER 1985

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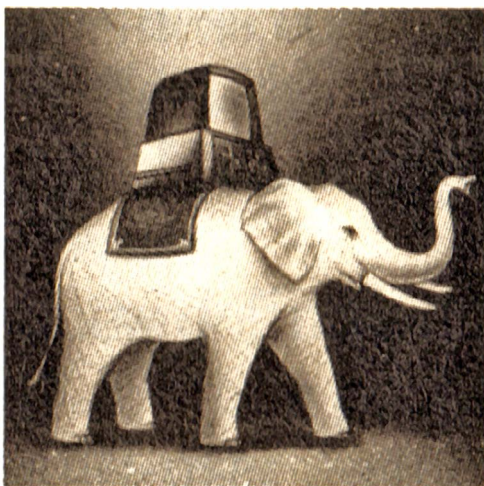
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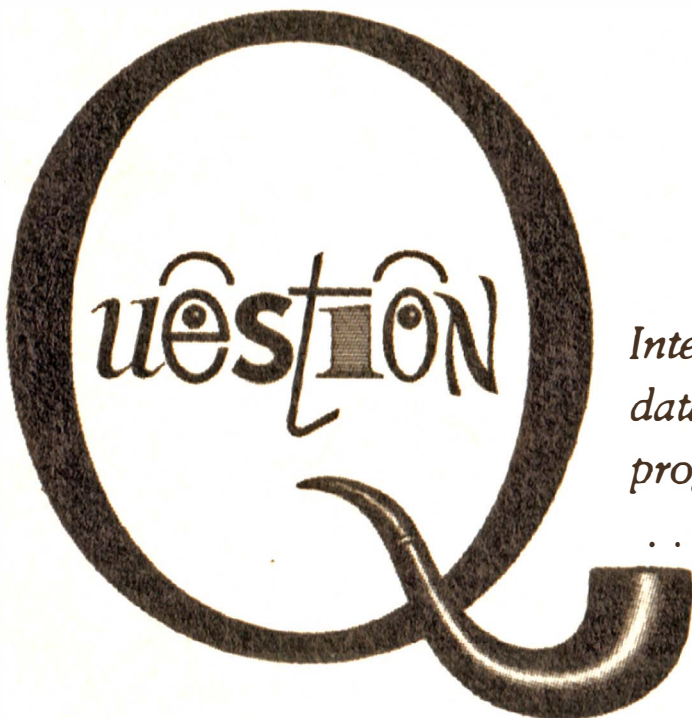
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1	ACE MANUFACTURING					
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3	1980 - 1984 (\$M)					
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5		1980	1981	1982	1983	1984
6	Net sales	\$2,058.9	\$2,427.8	\$2,957.8	\$3,531.3	\$3,616.7
7	Less: Cost of Goods Sold	1,379.5	1,663.5	2,212.3	2,591.4	2,753.8
8	Gross Profit	\$679.4	\$764.3	\$745.5	\$941.9	\$862.9
9	Less: Depreciation	283.7	189.3	193.9	221.8	251.7
10	Selling, Gen. & Adm.	318.9	376.6	457.1	546.7	628.2
11	Operating Profit	\$156.8	\$198.4	\$93.5	\$174.2	(\$9.2)
12	Add: Other Net Income	65.8	59.8	53.8	71.8	53.4
13	Interest Income	8.8	8.8	8.8	8.8	8.8
14	Less: Interest Expense	24.9	32.5	21.9	23.1	68.4
15	Pretax Income	\$197.7	\$225.7	\$125.4	\$222.9	(\$15.2)

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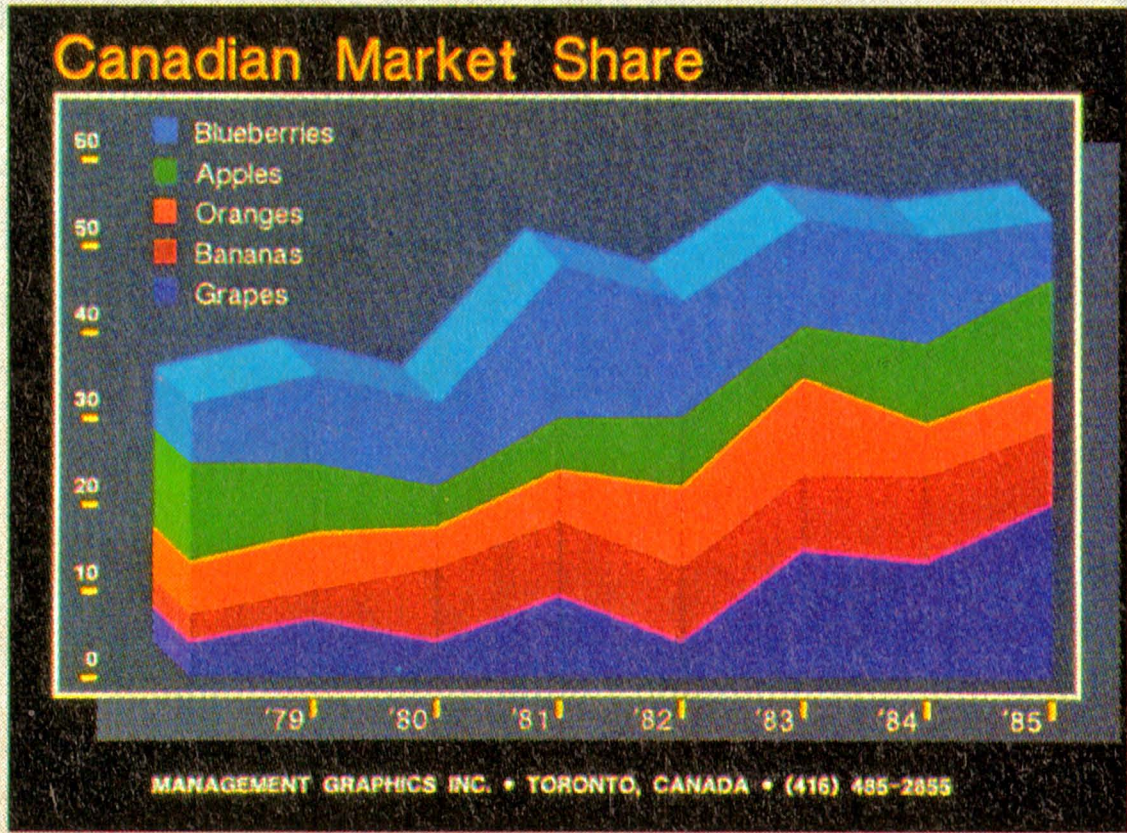
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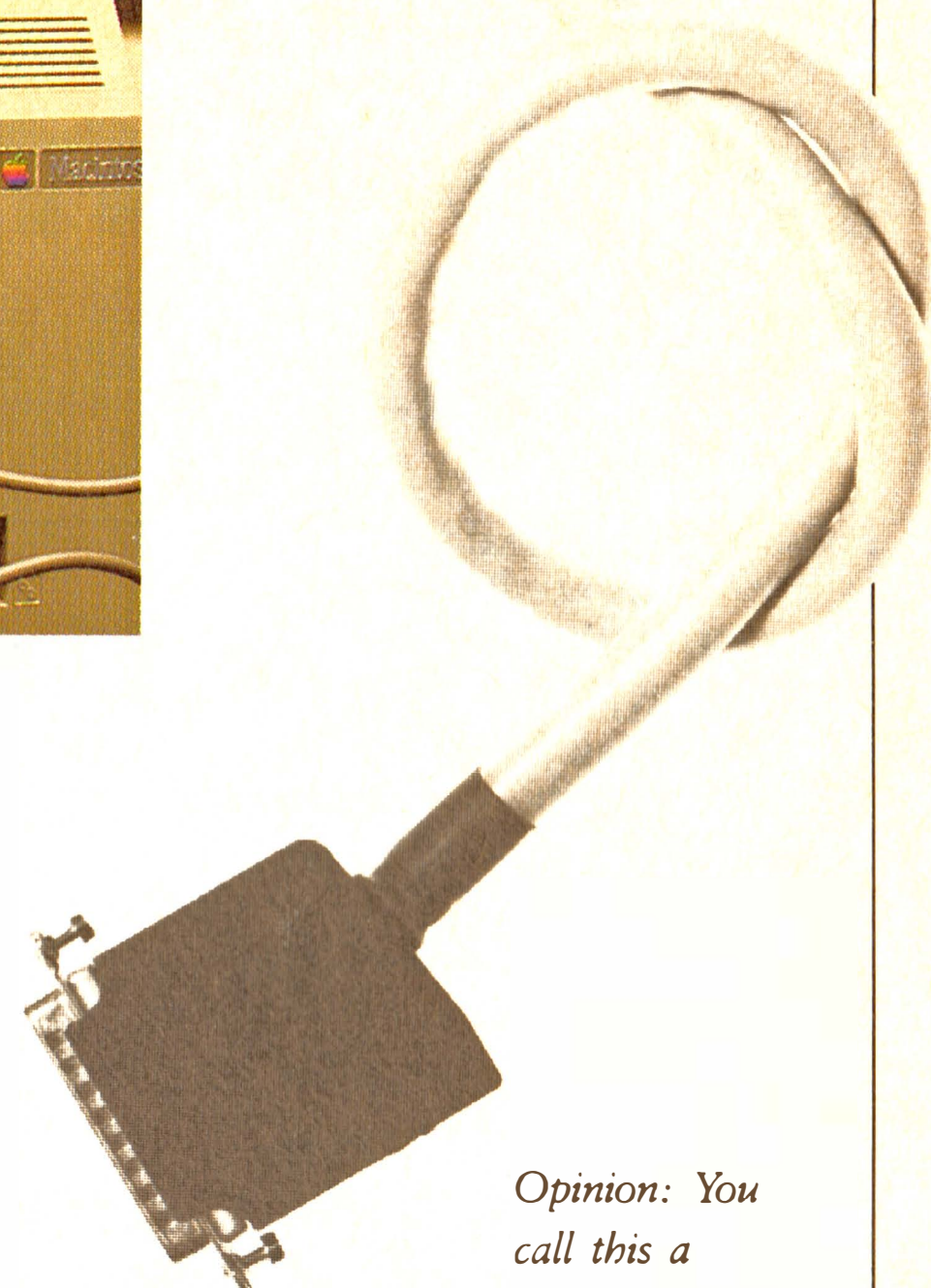
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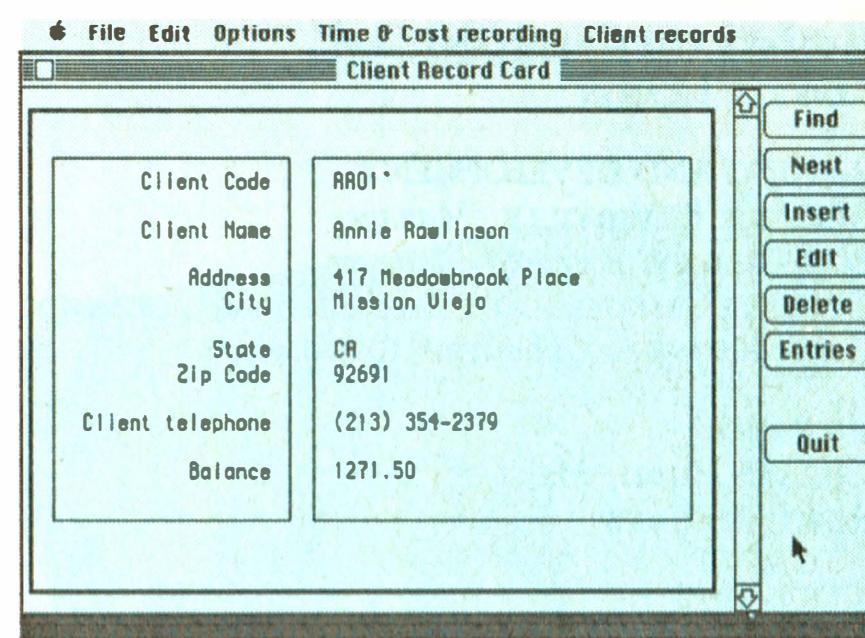
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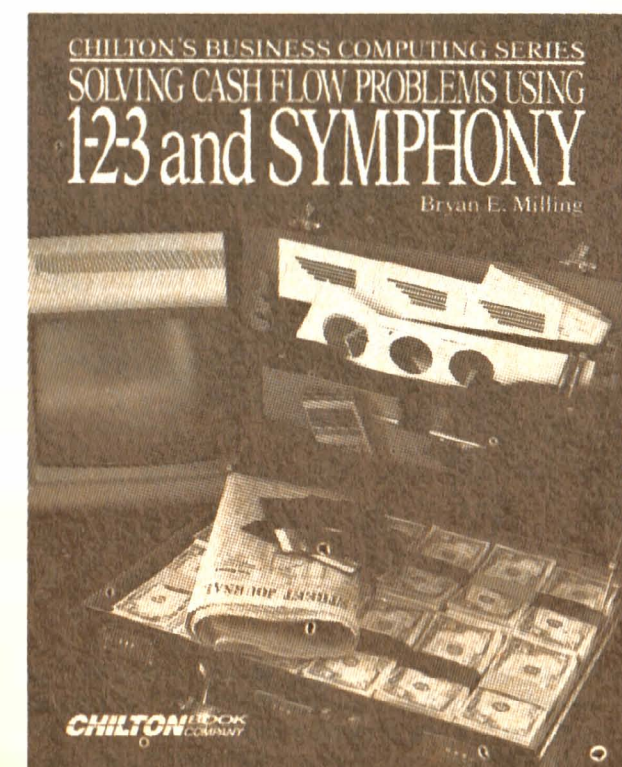
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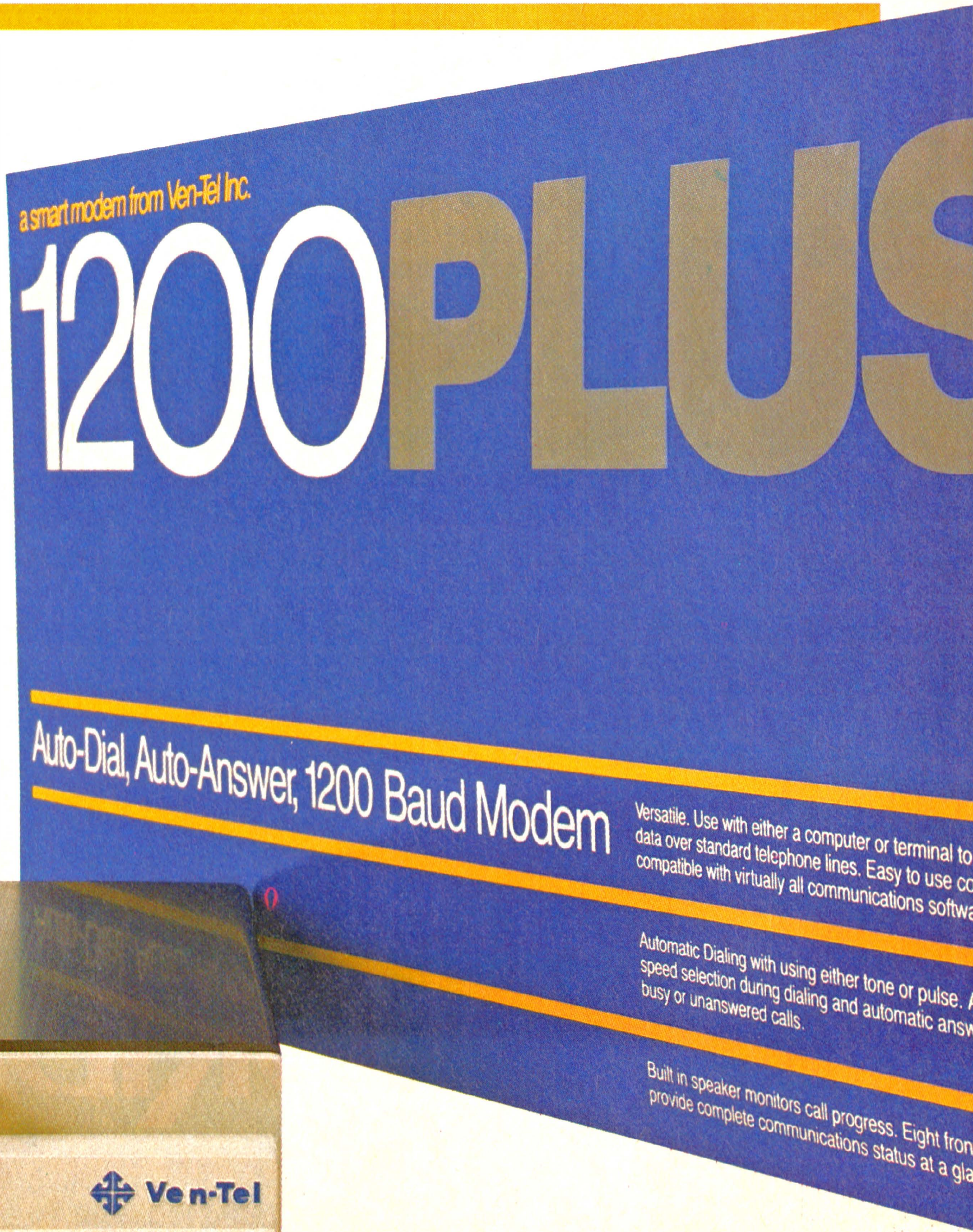
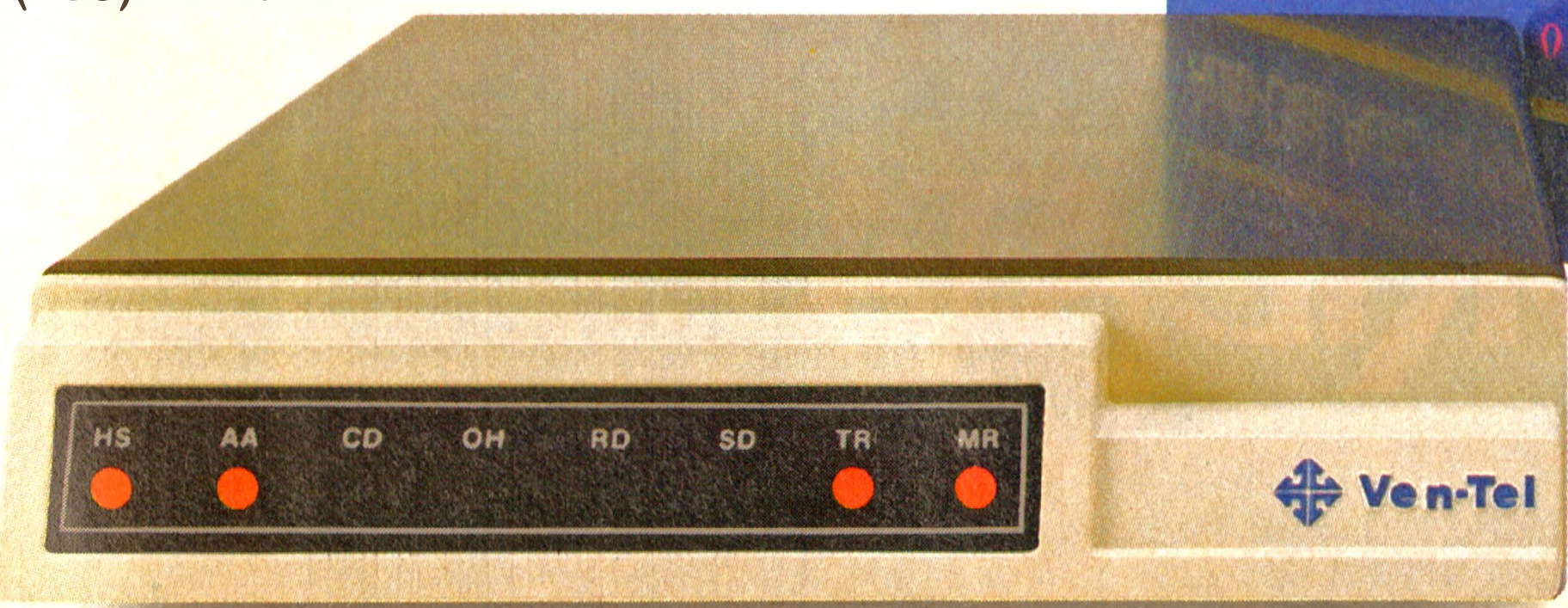
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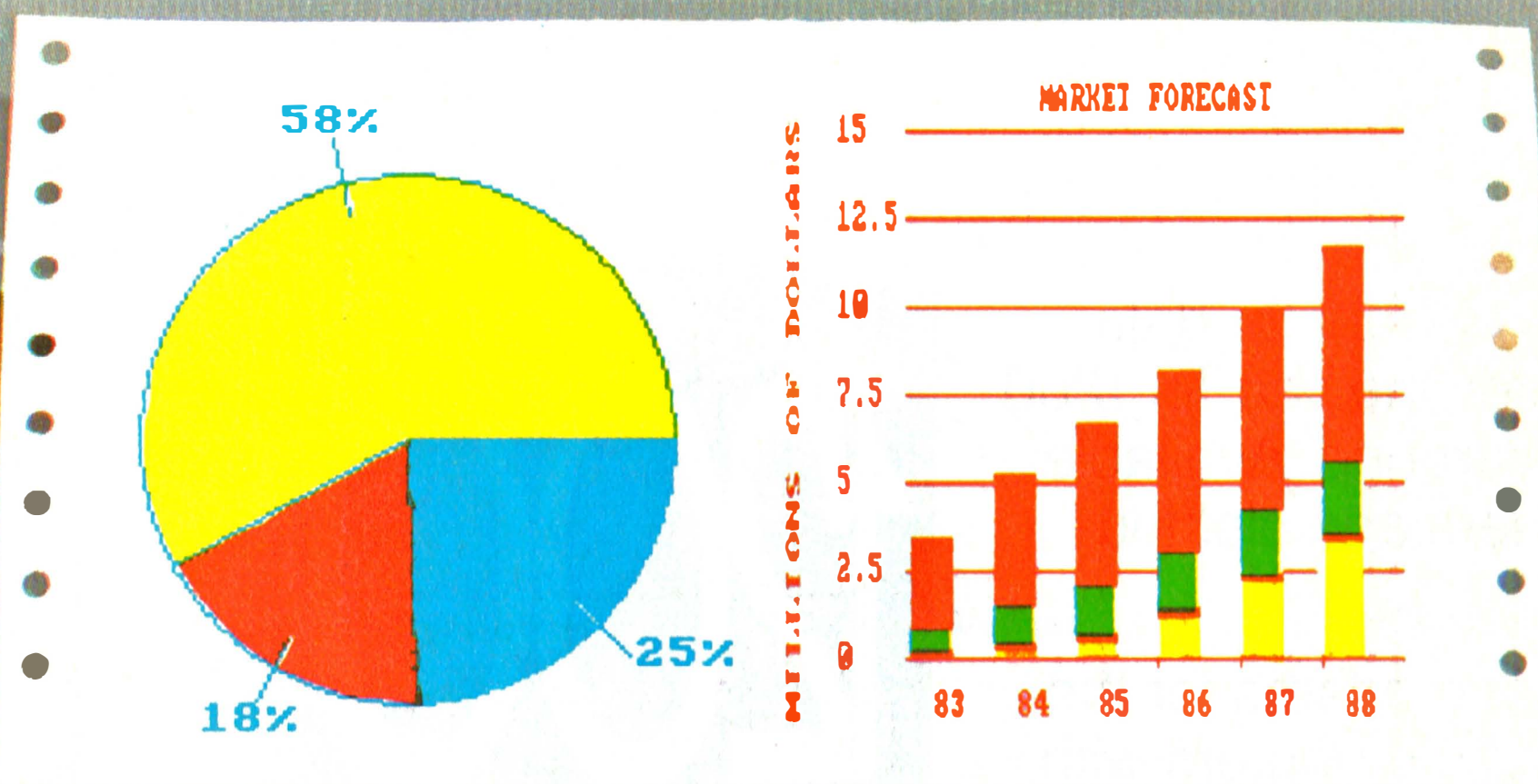
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ACCESS

NEWS

Changes in the 1-2-3 Marketplace

If you use Lotus's 1-2-3, get ready for some changes. Not only is Lotus Development Corp. (Cambridge, MA) planning major alterations to the phenomenally successful spreadsheet that dominates the spreadsheet software market for the IBM PC and similar machines, but other software publishers are also planning changes—either new products designed to work in conjunction with 1-2-3 or products designed to replace 1-2-3.

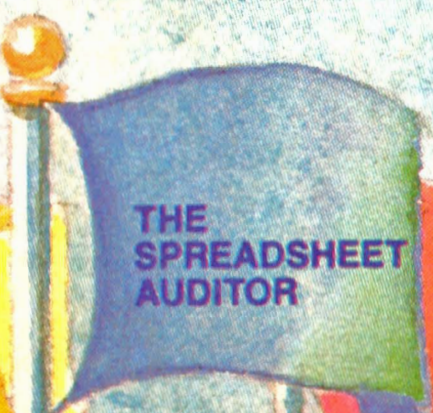
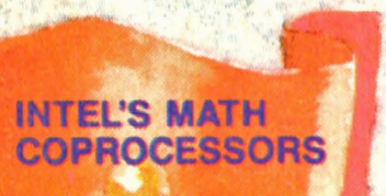
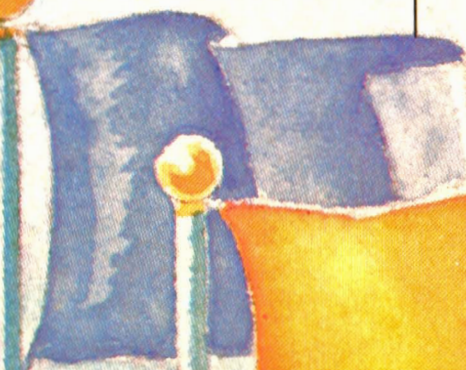
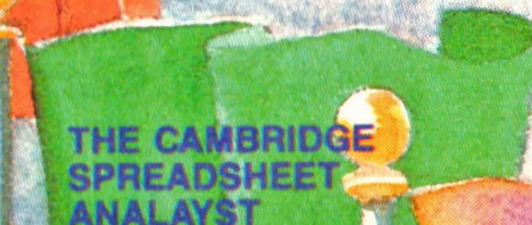
Lotus's enhancements to its spreadsheet, which will be known as 1-2-3 Release 2, may be the most significant in terms of the number of users that will be affected.

The new release supports a spreadsheet of 256 columns by 8192 rows, four times as large as the previous version and the same size as the worksheet in Lotus's Symphony integrated software. And you will be better able to utilize the increased size with an advanced memory-management scheme that lets you

put cells anywhere in the worksheet without allocating memory to blank cells. Additionally, the product supports the Lotus/Intel/Microsoft Expanded Memory Specification, allowing up to four megabytes of expanded memory above the 640K bytes of conventional memory. However, Lotus officials point out that the program (like Symphony) keeps integers and pointers in the conventional memory, so an expanded memory board may not increase the available worksheet space as much as you would expect.

The new version also includes 40 new commands in the macro language, which can still run all macros created with the earlier version of the program, and 39 new spreadsheet functions, including regression analysis on up to 16 variables, matrix manipulation, and the ability to take an ASCII text file and parse it into labels, numbers, dates, times, and so forth.

Other changes in the new version: support for Intel's



8087 and 80287 math co-processors, which allow some calculations to be made much faster; a new method of indicating when memory is running out; password protection to control access to individual files; the ability to calculate international dates and times; and a new exploded pie chart as part of the graph choices.

The product can directly read and process files created by Symphony and can translate files created by Lotus's Jazz for the Macintosh. It also is the first Lotus product to use a copy-protection scheme that lets the program be started from a hard disk without the use of a key disk.

As with the previous version, 1-2-3 Release 2 carries a list price of \$495; those who purchased the older version of 1-2-3 after April 24, 1985, can receive an upgrade for free; other users of 1-2-3 can upgrade to the new version for \$150.

Because 1-2-3 has been so successful, many independent software firms have tried to create programs that work with it.

For example, Note-It from Turner Hall Publishing (Cupertino, CA) lets you create and attach personalized notes to specific cells in your worksheet. The \$50 program, which remains in memory, lets you document the worksheet as if you were using index cards, explicitly stating your assumptions so that the worksheet will be easier for someone else to understand. Note-It requires about 64K bytes of additional memory and can store up to 100 notes of 10 lines of 50 characters each for each worksheet.

Other 1-2-3 add-on products make it easier to keep track of variables and formulas throughout your worksheet. The Spreadsheet Auditor (\$149, Consumers Software Inc., Gilroy, CA) helps you locate errors in your worksheets by producing reports showing how cell contents are calculated from your instructions.

And The Cambridge Spreadsheet

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13						
14	Operating Profit	\$156.8	\$198.4	\$93.5	\$174.2	(\$8.2)
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16	Interest Income	0.0	0.0	0.0	0.0	0.0
17	Less: Interest Expense	24.9	32.5	21.9	23.1	60.4
18						
19	Pretax Income	\$197.7	\$225.7	\$125.4	\$222.9	(\$15.2)
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LOTUS 1-2-3 RELEASE 2's WORKSHEET IS FOUR TIMES LARGER THAN THAT OF THE ORIGINAL 1-2-3 PROGRAM.

Analyst (Cambridge Software Collaborative, Cambridge, MA) can scan your worksheet for errors or for circular references and can show cross-references indicating how a cell is used in formulas throughout a worksheet. The \$149 product also has a "probe" feature that will trace the logic of your worksheet and show intermediate results and formulas. The firm plans to add a reporting feature to its software this fall.

Other products that add functions to 1-2-3 are described in "4-5-6 World" (Santa Barbara, CA) a 244-page catalog that lists software and hardware add-ons for 1-2-3 and Symphony ranging from books to memory expansion kits, other hardware accessories, and a wide variety of templates ranging from tax planning to estimating construction costs.

Some firms are not content just to add on to 1-2-3; instead they hope to replace it with their own products. Longtime competitors such as Microsoft (Bellevue, WA) and Computer Associates (San Jose, CA) have recently released new versions of their spreadsheets, Multiplan and SuperCalc 3, respectively, both including larger worksheet areas.

Several new programs are entering the field as well. Javelin (Javelin Software Corp., Cambridge, MA) shows 10 different views of a central information base containing both the data and the logic behind financial models. The \$695 package offers worksheet and chart views, as well as more unusual views showing a cross-tabulation of different variables, a diagram showing the model's

logic in a flowchart-like design, and notes listing assumptions behind it.

Paperback Software (Berkeley, CA) is also taking a very different tack with its \$99.95 VP Planner. Though the product is considerably less expensive than 1-2-3, it is designed to be completely compatible with both the files and keystroke commands used by 1-2-3. In addition, VP Planner will be able to access database files created by Ashton-Tate's dBASE line or by its own multidimensional database.

All these firms have high hopes for taking (or getting back) part of the spreadsheet market so dominated by Lotus over the past few years. Time will tell whether they succeed.

—MICHAEL J. MILLER

Apple II Market Expands

Last month, we reported on Apple's latest hardware and software enhancements for its Apple II line, including a 3½-inch 800K-byte Unidisk microfloppy drive and a memory card that can store up to 1 million characters of information in addition to the 128K bytes of storage available on the Apple IIe and IIc. Now a large number of products have been introduced to exploit the new features. The hardware and software will help to bring the Apple II up to date with recent advancements in applications software development.

Perhaps most significant are two new environments that make the Apple II look more like Apple's Macintosh. One is Catalyst 3.0, a new version of a program selector from Quark (Denver, CO) that sells for \$149 and gives the Apple II Mac-like pull-down menus, icons, and windows.

The floppy disk with the flop proof guarantee.



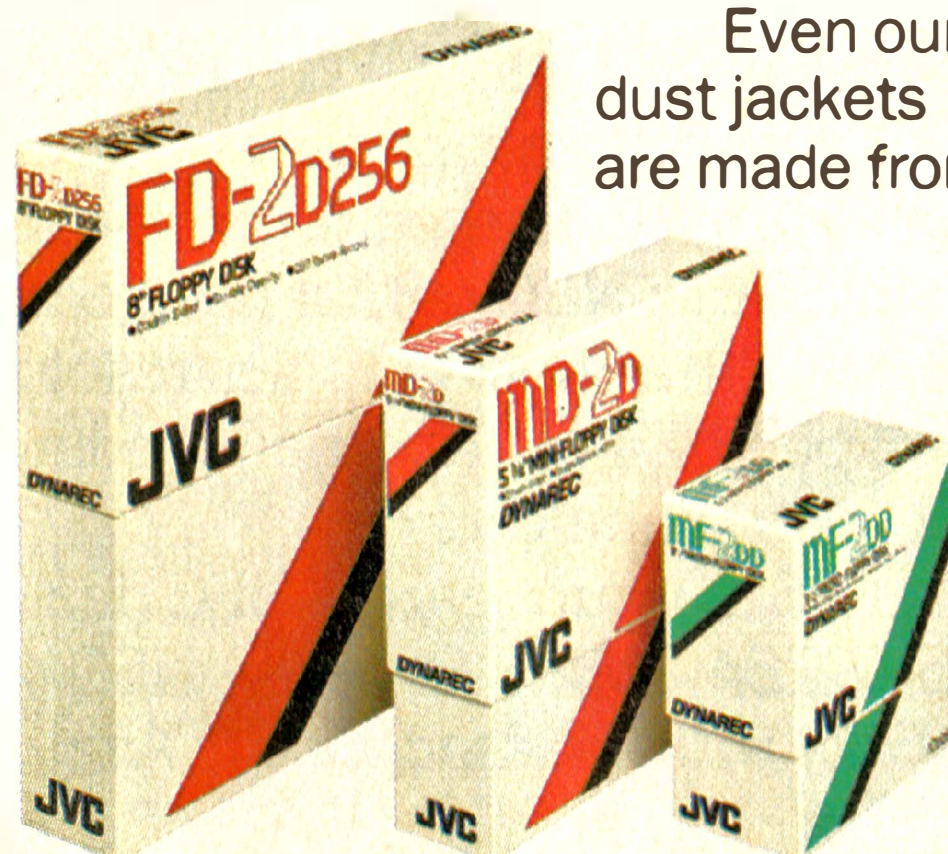
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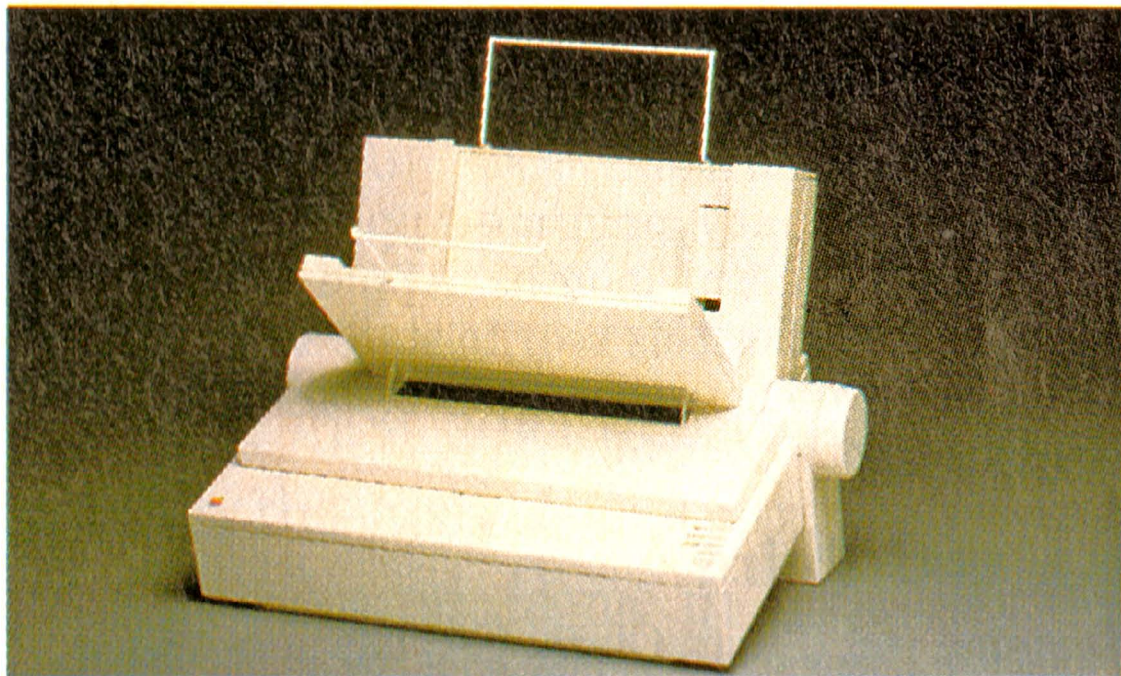
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Inquiry 26

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APPLE'S NEW COLOR MONITOR, 800K-BYTE 3½-INCH DRIVE, AND AN IMPROVED IMAGEWRITER.

Quark is helping other software firms develop programs that will use the Catalyst desktop system, including Mouse Write (\$125) from Roger Wagner Publishing (Santee, CA), Sensible Speller (\$125) and Bookends Reference Management System (\$124.95) from Sensible Software (Birmingham, MI), and the Mouse Series from International Solutions (Sunnyvale, CA), which includes Mouse Word (\$129.95), Mouse Calc (\$149.95), and Mouse Budget (\$69.95).

The other new environment is Mouse Desk from International Solutions. The firm says its desktop system will replace all cryptic operating system commands for file handling when using any of the firm's software with a mouse-driven user interface. At press time, International Solutions said Mouse Desk will sell for less than \$50.

A variety of other programs that take advantage of the Apple II enhancements have been announced. Among these is Andrew Tobias's Managing Your Money, from MECA (Westport, CA), a financial management program that offers such applications as budgeting, checkbook balancing, tax planning and preparation, insurance planning, and stock portfolio management. According to MECA, the Apple release is identical

to the popular IBM PC version.

Quicken, a financial management program from Intuit (Palo Alto, CA), is also available in an enhanced version for the new Apple II products: you can now transfer Quicken payment and deposit information to an Appleworks spreadsheet.

The additional memory on the Apple II will likely lead to the development of more products that will work with or enhance AppleWorks. Pinpoint Publishing (Oakland, CA) has introduced Pinpoint, a \$69 set of nine desktop accessories that can be used without exiting from AppleWorks or other applications that use Apple's Pro-

DOS operating system.

Other already-released programs of significance that work with the new Apple II products include Software Publishing's (Mountain View, CA) PFS series; Computer Associates' (San Jose, CA) SuperCalc 3a, which can now print graphics in color with Apple's new ImageWriter II printer; and Business Works from Manzanita Software Systems (Roseville, CA). Business Works is a set of five accounting modules: System Manager (\$95), General Ledger (\$395), Accounts Payable (\$395), Accounts Receivable (\$395), and Payroll (\$445). To use these Business Works packages you'll need two Unidisks or one plus a hard disk.

Some hardware firms offer alternatives to Apple's own memory enhancements. Checkmate Technology (Tempe, AZ) and Applied Engineering (Carrollton, TX) have introduced add-on memory boards that increase the internal capacity of the Apple IIe and IIc to more than a million characters of information. In addition, Checkmate's MultiRam board can be expanded to include a 16-bit microprocessor, the 65C816, to increase the speed of the Apple II.

Industry observers expect Apple Computer will eventually release its own 16-bit version of the Apple II.

—PAUL FREIBERGER

More Macintosh Software

Several firms will soon be shipping new accounting software for the Apple Macintosh. Layered Software (Boston, MA) has announced the Insight accounting line, while Digital, Etc. (Santa Monica, CA) announced MacAccountant. Also new for the Mac are Mac One Write from Sierra On-line (Coarsegold, CA) and Accountants Choice from Sierra Information Systems (Cupertino, CA), a seven-module set of packages, including Accounts Receivable.

These products join two Mac accounting packages announced earlier—the Back to Basics series from Peachtree Software (Atlanta, GA) and the Rags to Riches small-business series from Chang Labs (San Jose, CA).

The Macintosh desk-accessory market is heating up as well, with a number of companies now offering a wide assortment of products. Borland International (Scotts Valley, CA) now markets a Macintosh version of SideKick. The \$85 program includes notepad, telecommunications, phone dialer, clock, print spooler, and index-card file modules.

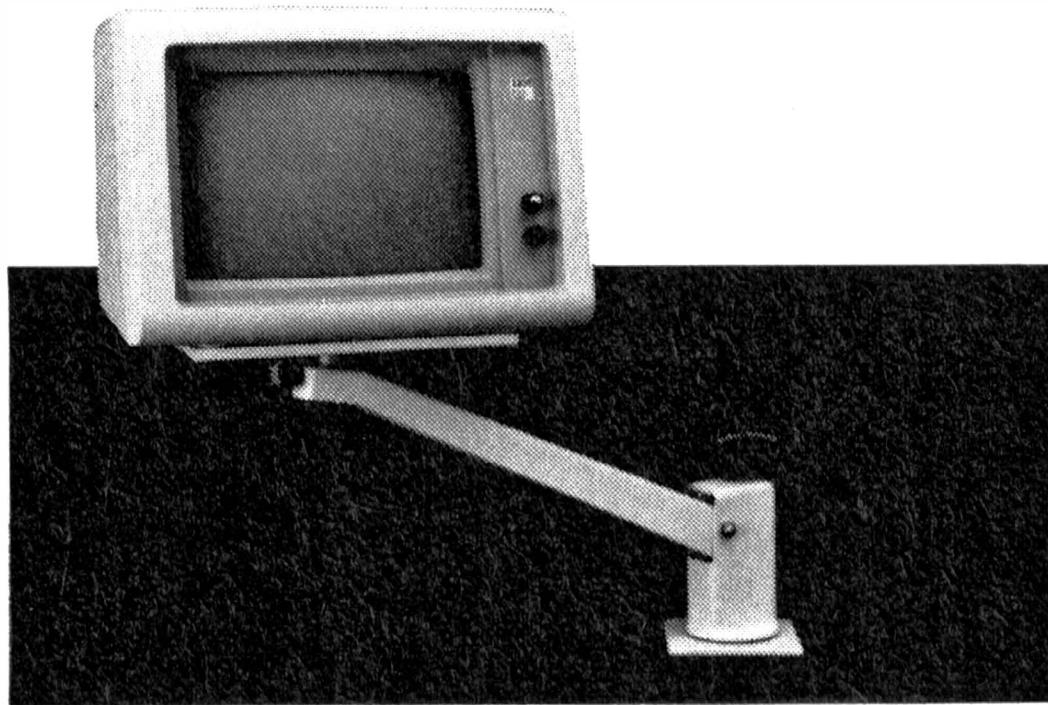
Additionally, two firms offer desk accessories that can record mouse movements, keystrokes, and commands to let you set up your own macro routines. The simpler of the two packages is Mac Tracks, a \$30 product from Assimilation Inc. (San Jose, CA).

The second of the new offerings is Tempo, a \$99 package from Affinity Microsystems (Boulder, CO). Tempo appears to be more sophisticated; in addition to the simple recording and playback features, it has an editing facility, pause for data entry, and logical operators such as less-than and greater-than. You can use Tempo to string together multiple macros or even multiple programs.

—MICHAEL J. MILLER

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OBSERVATIONS

No Jobs at Apple

Apple Computer's mercurial cofounder Steven P. Jobs resigned from his position as Apple chairman in September. The acrimonious departure followed his disclosure that he was starting a new computer firm and taking at least five former Apple employees (including several top engineers) with him to work on his new venture. At press time, Jobs was widely rumored to be working on a powerful workstation for the university market. Meanwhile, Apple has prepared a lawsuit against its former chairman.

Jobs is only one of many longtime Apple employees to leave the firm in recent months. Apple cofounder Steve Wozniak left earlier this year to start a new firm, Cloud 9, that will produce devices to let you run home appliances by remote control.

Of Mice and Paint

Mouse Systems Inc. (Santa Clara, CA) has announced PC Paint Plus, an enhanced version of its PC Paint drawing package. The new version provides integration of text, graphs, and pictures by letting you load and edit files from word processors as well as charts created by programs such as 1-2-3. PC Paint Plus will retail for \$99 and will also be available with Mouse Systems' optical PC mouse for \$220.

International Microcomputer Software Inc., or IMSI (San Rafael, CA), also markets the Mouse Systems optical mouse along with PC Paintbrush software for \$220; it continues to sell PC Paintbrush alone for \$139. The program was recently upgraded so that it can take advantage of IBM's Enhanced Graphics Adapter.

Further confusing matters, Microsoft (Bellevue, WA) bundles PC Paintbrush with its mechanical mouse and has just released a new version of both the mouse and software. The new mouse has a more ergonomic design, twice the resolution, and is also quieter and more reliable than the previous version. It sells for \$195 for either bus or serial version and includes mouse menu software and PC Paintbrush.

All these programs are designed for the IBM PC and compatible computers.

Doubling Disk Sizes

At least two companies now offer external floppy-disk drives for the Macintosh. DataSpace Corp. (Ontario, Canada) makes a double-sided 800K-byte external disk drive for \$549 (U.S. retail price), while Haba Systems (Van Nuys, CA) offers a single-sided 400K-byte disk drive for \$499 and a double-sided drive for \$599. Haba will let purchasers of a single-sided drive upgrade to a double-sided drive for \$150 or get a dual-sided drive in addition to the single drive for \$200.

Haba, which recently purchased a controlling interest in Arrays Inc./Continental Software (maker of The Home Accountant and other programs) also has plans to offer a \$700 10-megabyte hard disk for the Atari ST, as well as a line of business form letters and prewritten wills that can be used on the Apple II family, Macintosh, and Atari ST.

—Continued on page 15

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In 1876 Alexander Graham Bell gave people an easier way to stay in touch. Today, we're doing the same for computers.

At Kyocera, we think it's about time computers had an easier way of staying in touch. That's why we're introducing a telecommunications package featuring our 1200 bps modem and Microsoft's Access software for IBM-PC, XT, AT and all compatibles.

It's the most advanced bundled system on the market. But you don't need an advanced degree in computer science to use it.

We designed our 1200 bps modem with a mind of its own. It can answer automatically, distinguish busy and dial-tones, even handle voice and data communications at the same time. And you won't have to work overtime memorizing mind boggling command sequences, because we've also given our modem built-in help menus.

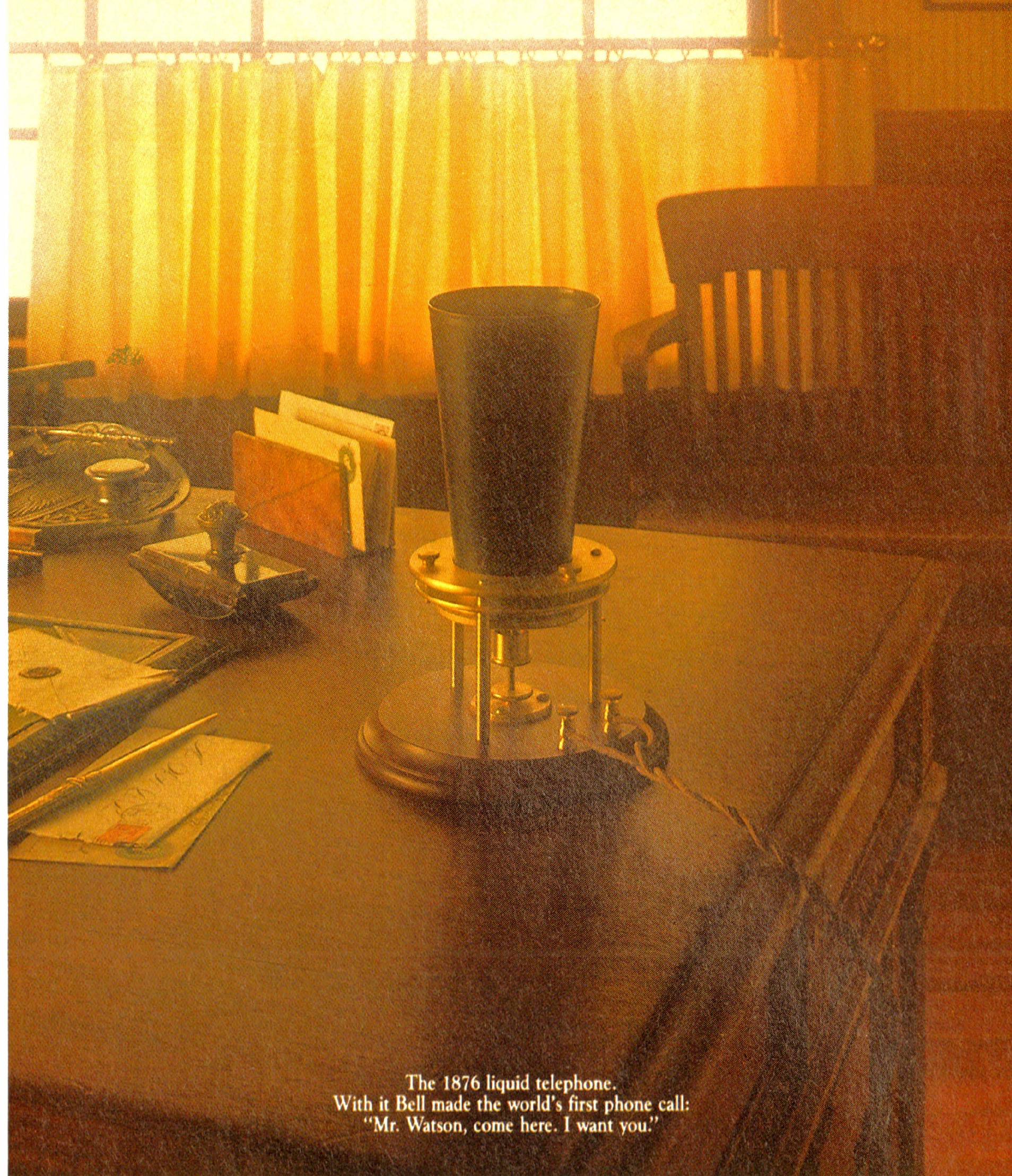
For software we teamed up with the most advanced telecommunications program available, Microsoft's new Access. Only Access features X.PC protocol which lets you simultaneously monitor up to 15 live connections through separate "windows" on your screen.

For instance, as one window displays stock market returns, another can provide market analysis. Through a third window, you can book an airline flight via OAG (Official Airline Guide). All the while, X.PC checks data transmissions for errors.

Access also lets you compose, send and receive letters through electronic mail services.

The Kyocera 1200 bps modem with Microsoft Access is available in stand alone or direct card and includes all necessary accessories. And because it's bundled, you'll save a bundle.

If Alexander Graham Bell were around today, he'd wish it was his idea.



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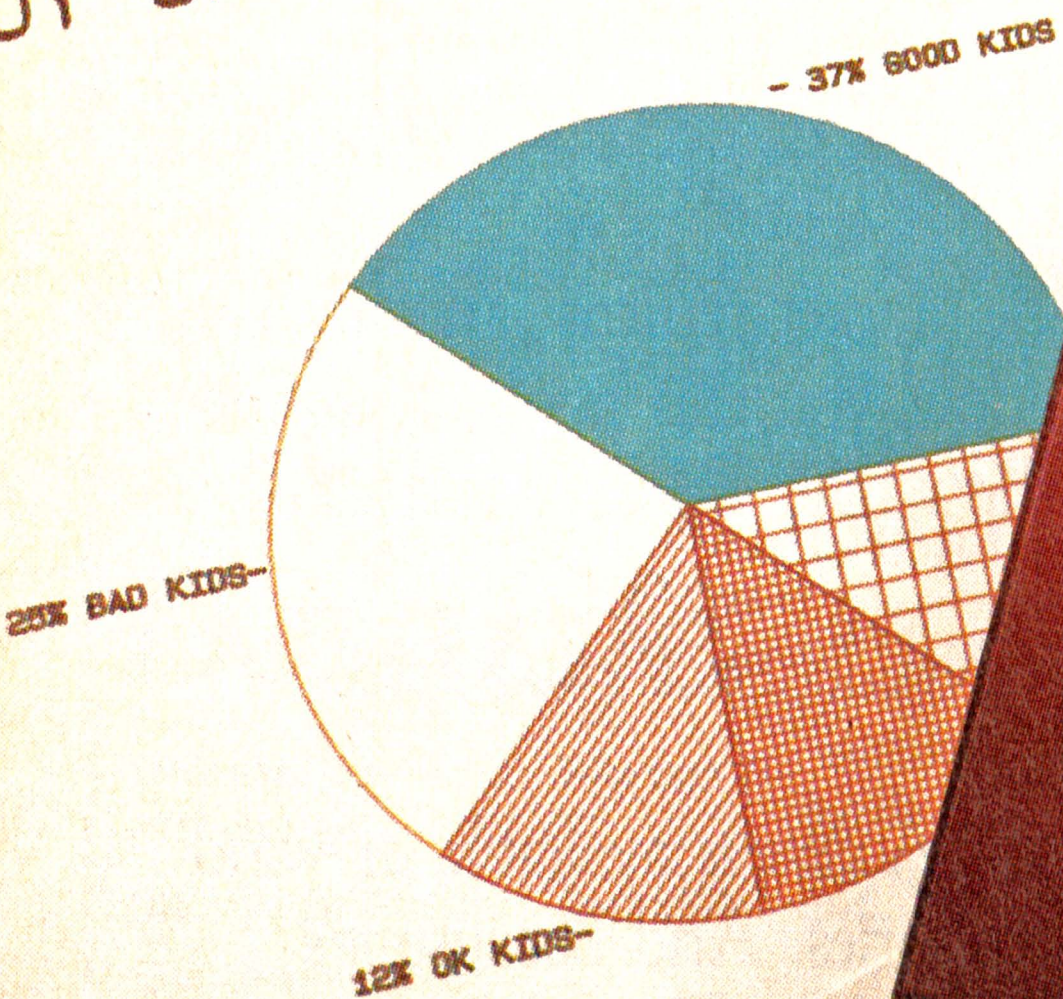
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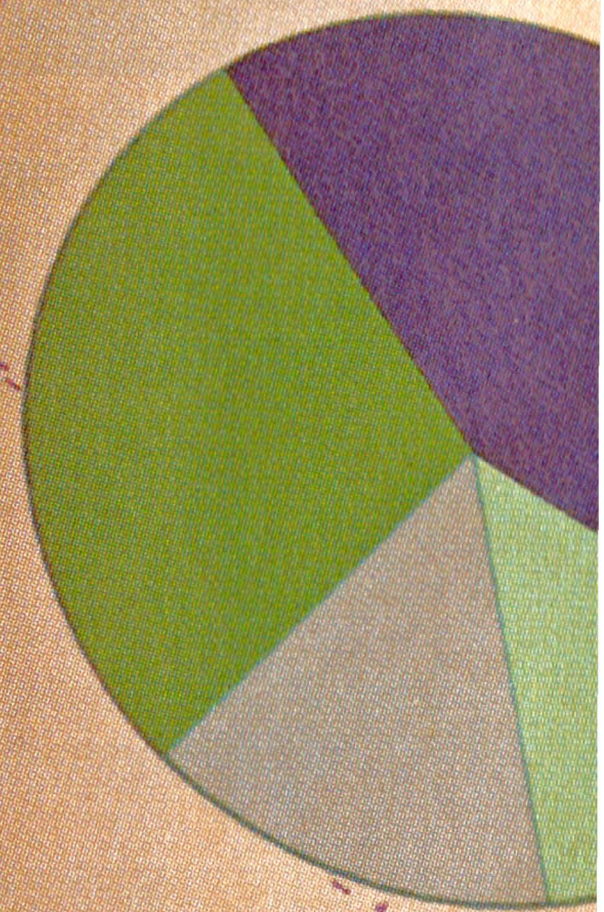
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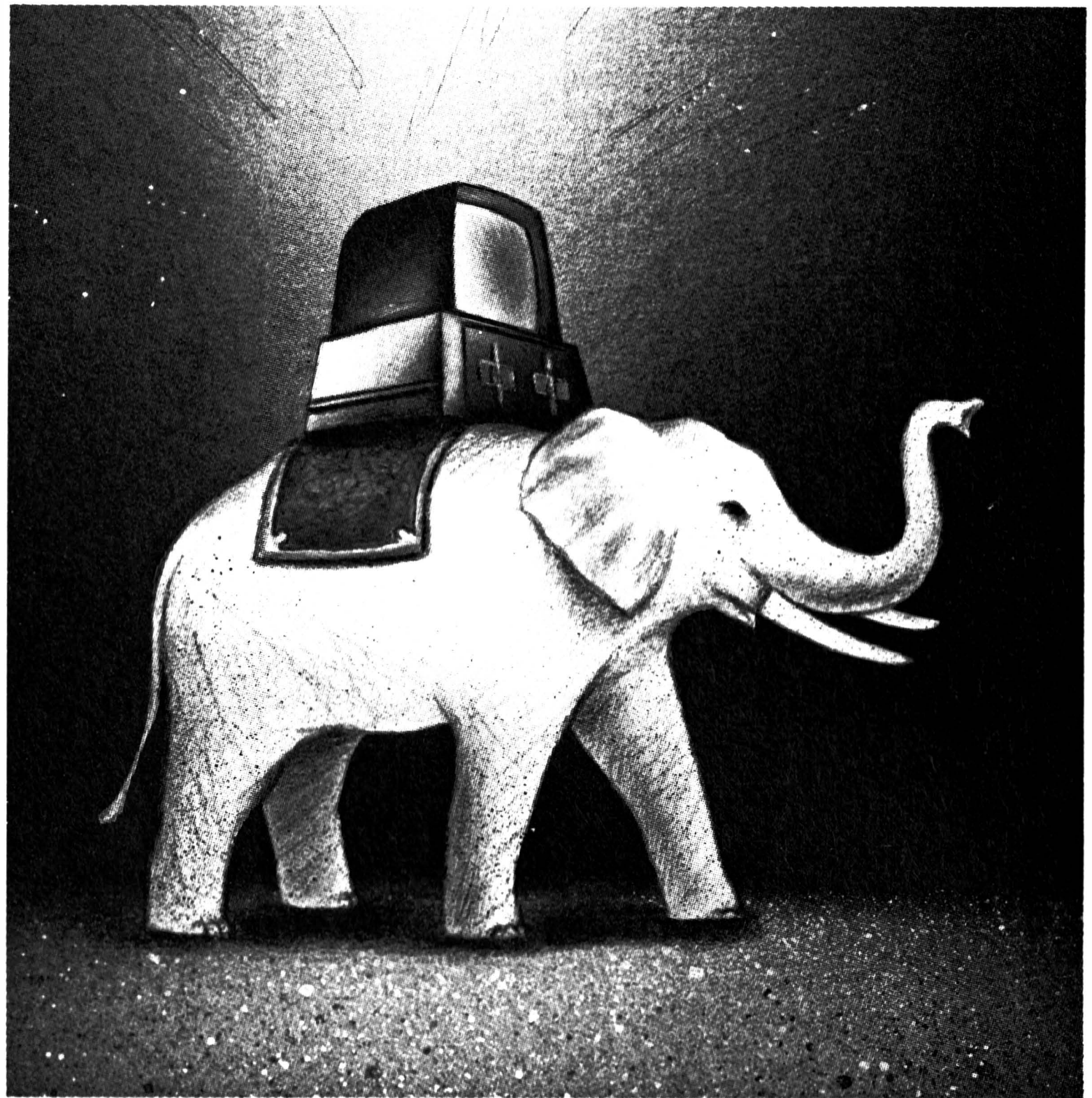
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16% LAND

Continued from page 12—

Updates

■ Rumors that IBM might replace PC-DOS with a proprietary operating system were apparently put to rest by an announcement in August that Microsoft and IBM would continue to work together to jointly develop operating systems and other system software products. ■ General Computer Co., maker of the Hyperdrive internal hard disk for the Macintosh, has announced a 20-megabyte version called the Hyperdrive 20. The new product will cost \$2795, and owners of the older 10-megabyte drive will be able to upgrade for \$895. Meanwhile, Apple has set a price of \$1499 for its own 20-megabyte external Mac hard disk but said it would not be available in quantity until January. ■ The price of memory boards for the IBM PC and compatibles is dropping rapidly. Latest in this market is Turner Hall Publishing (Cupertino, CA), which plans to offer a \$99.95 plug-in board with 256K bytes of RAM, a clock/calendar, and clock, print-spooler, and disk-emulation software. Turner Hall's parent company, Symantec, will offer a 256K-byte board for \$50 as an option to purchasers of its Q & A file manager. ■ A new ROM chip for the Tandy Models 100 and 200 and the NEC PC-8201 contains three different programs in 32K bytes of memory. The \$230 product from Traveling Software (Seattle, WA) includes IDEA!, an outline processor; T-base, a database management system; and T-Writer, a text formatter. ■ NEC Home Electronics (Elk Grove Village, IL) has placed a larger LCD screen on its PC-8401 portable computer. Although the new unit still displays 16 lines by 80 columns, the firm says the characters are larger and thus more legible. ■ Software Publishing Corp. has sold its Power Up! catalog division to a new firm called Channelmark (San Mateo, CA). Software Publishing will retain a 10 percent interest in Channelmark, which will be headed by the same people who ran the catalog operation.



Harnessing the White Elephant

That outmoded 8-bit business computer can still carry a respectable load

If your business is like most, you bought small computers one or two at a time, always striving to buy the latest, or at least the best, for your money. You purchased a CP/M-80 machine four or five years ago for word processing and mailing lists. A few years later, an Apple III looked like a good bet for spreadsheets and inventory. Last year you realized that you desperately needed Lotus's 1-2-3, so an IBM PC or AT nudged itself into the work space. Suddenly that lowly CP/M-80 machine with its paltry 64K bytes of memory and that forlorn and company-orphaned Apple III seem nearly useless.

Sadly, many of these seemingly outmoded older computers simply gather dust. But that shouldn't be the case—those white elephants can

become real workhorses. These “antiques” are still very efficient at their original tasks and can frequently complement the newer, racier units in the office. Why not consider pressing them into service as print spoolers, mailing-list stations, stand-alone databases, file servers, or even electronic hosts for employee or customer bulletin boards?

If, for instance, you bought a CP/M machine for word processing, don't forsake the poor critter now. The Z80A or Z80B central processor at the heart of the older machine runs at speeds that actually rival or surpass those of the 8086 or 8088 CPUs used in the IBM PC or its clones. (In fact, if you are lucky enough to have a CP/M machine with a Z80H installed, you have a blazing 8-MHz

processor—take that, AT!) Granted, the 64K-byte memory limit of most older 8-bit computers limits the word-processing software you can run, but that's no reason to turn up your nose at the CP/M version of a tried-and-true performer like WordStar.

In an office that relies on word processing every day, having a machine dedicated solely to the task can be both convenient and efficient. That CP/M machine, Apple III, TRS-80 Model II, or whatever, can more than earn its keep by serving rather specific and time-intensive word-processing needs. A machine used only for sending out form letters, sales figures, or repetitive memos would lighten the load on your new PC or AT.

This sort of convenience is possible because text files in ASCII or WordStar format are transportable. Your text editor doesn't care if the file was created on an 8- or 16-bit machine. I often use my 8-bit machine to check the spelling and print out a finished version of manuscripts—while the white elephant prints, I have my PC back to tackle the next task. Why overload your number-one machine if you have a capable player sitting on the bench.

And speaking of files, if your white elephant has a hard disk, why not enlist it as a sort of file server? I'm not talking about the honest-to-goodness file server that coordinates today's modern local network but rather a storehouse for files that several people in our office need access to. Equipped with the appropriate software (which, especially for CP/M machines, is available in wide variety from the public domain), the machine could be accessed via a null-modem link or intraoffice phone line, and workers could simply pull off copies of the files they needed to work with. You won't have multilevel security, record locking, and other true networking features, but the application will cost you virtually nothing.

Similarly, an unused or underused machine could become a real time saver if it were set up as a stand-alone database for frequently accessed material. For a quick call-up

of customer information and statistics or simply names and addresses, such a dedicated system will be ready—since the system is running only one application, there is no need to load or unload other programs and their related files. And because it's always on duty, you can make updates to the data files at any moment. Even a telephone directory

ALTHOUGH
the new PCs and ATs
look sexier than
the old white
elephants, give
the maligned
pachyderms
another chance.

would be handy to have at everyone's disposal—and it's a sight better than watching the chips rot out of the motherboard from neglect.

Finally, your older machine could become a real star if you give it a full-time job as the host of an electronic bulletin board. Whether for internal use only or open to customers, clients, or associates, your own bulletin board can be a valuable communications or customer relations tool. You might not be able to find the software you need in the public domain—especially if you're going to be handling customer support—but because a bulletin board demands the full-time commitment of a computer, it's a great way to get the most out of an unused machine.

Now if you are still skeptical about putting these old machines to work and are entertaining the idea of ridding yourself of them entirely, consider your options. No major retail computer store takes used micros for trade-in on new hardware—none. If you want to sell the computer and recoup a portion of your original cash outlay, be prepared for disappointment. John Adler of Computer

Exchange Inc., the Midwest's largest used micro dealer, estimates that an Apple III or CP/M machine just two or three years young fetches a meager \$600 to \$800 right now.

This brings up a new angle. If you're at the stage when you're considering computerizing a small business but aren't prepared to make a heavy investment, why not start with a used machine? The cost of the experiment is rock-bottom, and as we've seen already, you can find a productive use for the older machine if you later decide to go all the way with a brand new system. Resale machines are usually offered with all the applications software that the seller has ever purchased or developed for the retiring white elephant—many times, the value of the software thrown in the box equals or surpasses the purchase price. If you have a job that an older machine might handle admirably, the out-and-out purchase of a white elephant might be more cost-effective than buying a new unit.

One more note: if you're putting your old machine to work on an important dedicated task, you might want to think about buying a spare. Many people buying used computers today make the purchase for parts; they already own a herd of white elephants and are looking ahead to the days when one or two become a bit long in the tusk and need some surgery—a new disk drive, a drive controller card, or even the main processor. By stockpiling the older machines, they have a ready parts department. Anyone who has tried to find a broken widget for a discontinued Whammy 2000 will appreciate your advance planning.

Although those new PCs and ATs look promising, exciting and—yes, let's admit it—sexier than the old white elephants, give the maligned pachyderms another look. There's more to be done in your business than you have machines to handle. Saddle the ol' beasts up and let them lumber on. —STEVEN BOSAK

Steven Bosak, a freelance writer and member of the Computer Literacy Board for Columbia College of Chicago, wrote "Public Domain Proving Ground" in August's *Popular Computing*.

Go ahead, accuse us of sensationalism.

Over the next four pages, we're going to bare our specs and divulge all the nitty gritty details about the latest developments to come out of Apple Computer.

Starting with our new Apple® ColorMonitor IIc and ColorMonitor IIe.

In all modesty, we think these are the best color monitors you can buy at any price for your Apple II, II+, IIe or IIc personal computer.

Both have composite color, 13-inch screens that let you produce a dazzling array of multi-hued graphics. Without going to the expense of adding an RGB interface card or external adaptor.

Simply plug the monitor directly into the video output jack on the back

Here's the inside story on all the colorful things that have happened at Apple.

of your Apple, and you're ready to start computing in living color.

Which is terrific for games and graphics oriented programs like Apple Logo II, Instant Pascal™ and Dazzle Draw.

But not quite so terrific for text programs. As anyone who's ever gone blurry-eyed from trying to read words on a color CRT will readily attest.

Not to worry.

We've designed both ColorMonitors to automatically go from color to a high resolution, 80-column monochromatic mode anytime you use text software.

As you can see, we've also styled each ColorMonitor to fit in with our family looks. The ColorMonitor IIc is pure white, and has an optional rigid stand. While the ColorMonitor IIe is designed to rest



The ColorMonitor IIe on a IIe.



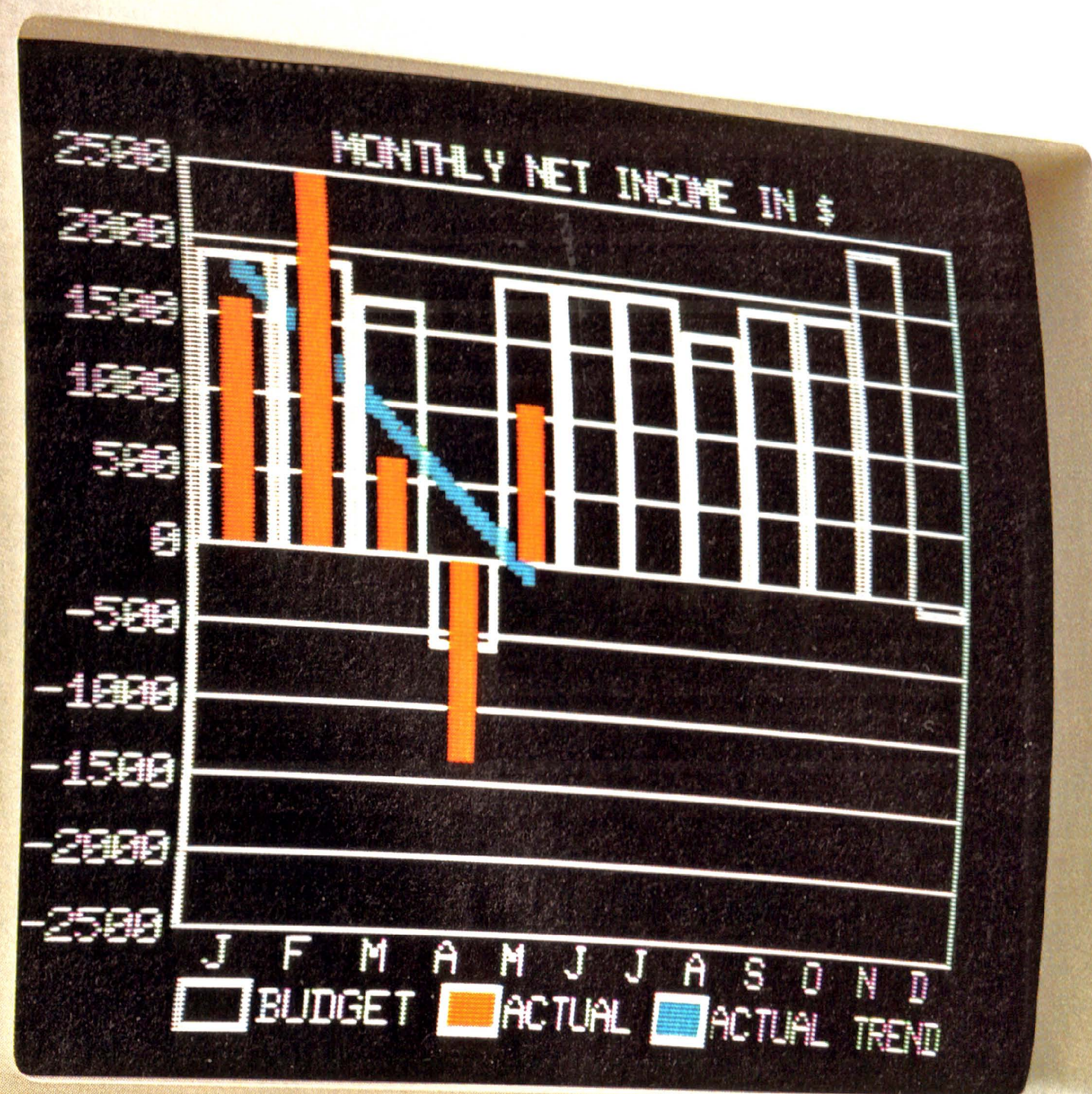
The ColorMonitor IIc on a IIc.

on top of your Apple IIe, and comes in our favorite shade of beige.

And thanks to some particularly bright Apple engineers, our ColorMonitors are compatible with virtually all existing Apple II software.

Well, there you have it. The scoop on one of the most colorful events in Apple history. But as you might expect, it's certainly not the whole story.

If you turn the page, you'll see that the saga continues.



The truth about our new color printer in black and white.

In case you haven't heard, Apple has a whole new cast of characters.

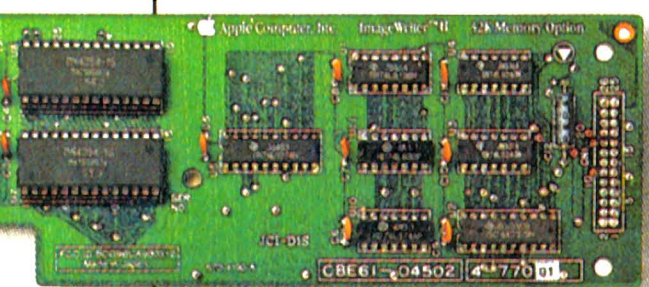
Our ImageWriter™ II printer.

Like its predecessor, the original Apple ImageWriter, our ImageWriter II is one of the most dependable dot matrix printers very little money can buy. And it's compatible with every Apple personal computer.

But that's where the similarities end.

The ImageWriter II prints faster and clearer than the original ImageWriter.

It cruises through drafts at a blazing 250 characters per second. Produces sharp graphics. Creates near letter-quality text. And lets you print in six vivid colors.



ImageWriter II
32K Memory Option.

Simply change the black ribbon to the continuous cloth, multi-color ribbon, and you're ready to churn out reams of yellow, red, blue, orange, green and purple output.

You can print pictures and greeting cards with software like Stickybear Printer. Design your own



color drawings with Blazing Paddles and Dazzle Draw. And whip out color business graphics using SuperCalc 3A, pfs: GRAPH or Mouse Calc.

As you would expect, you can vary the pitch and spacing on the ImageWriter II. And print in standard or half height.

But as you would probably never expect, the ImageWriter II is also expandable.

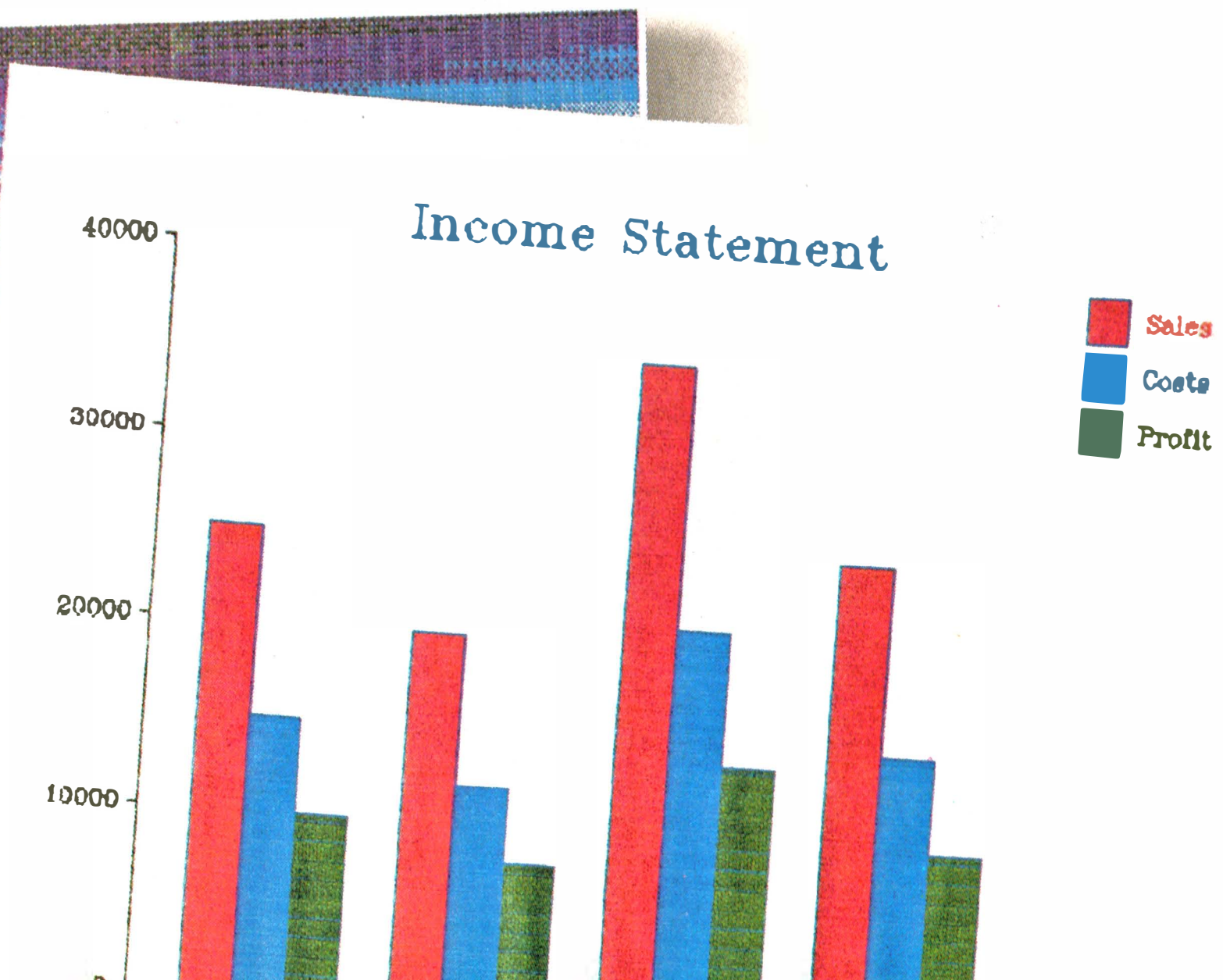
By adding the ImageWriter II 32K Memory Option print buffer, you can continue to compute

while the printer continues to print.

Attach the ImageWriter II SheetFeeder, and you can automatically load single sheets of paper into the printer.

And by having your authorized Apple dealer install our AppleTalk™ Option, the ImageWriter II can even be shared by several different Macintosh™ workstations.

Which means, for businesses, it can vastly improve the looks of one very important piece of paper: Your budget sheet.

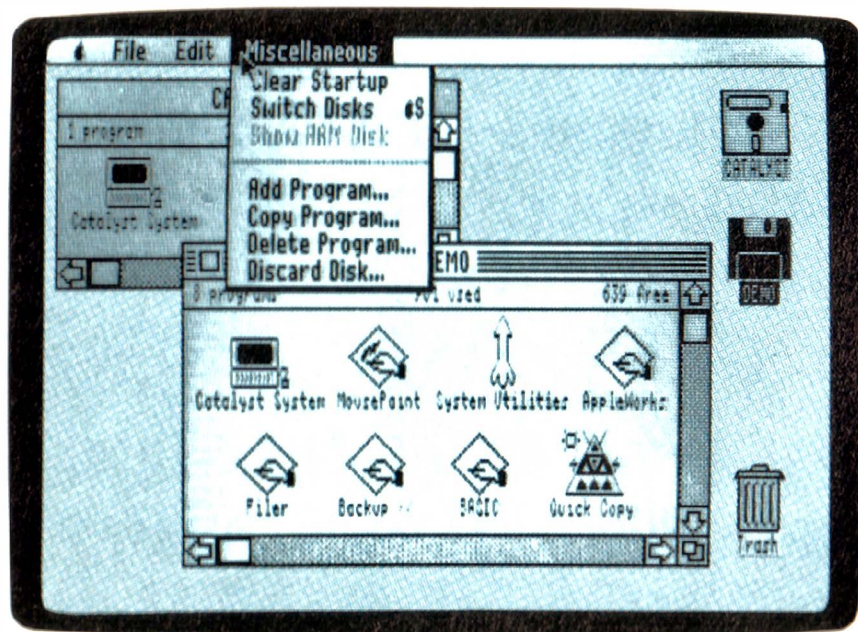


Stop flipping between floppies.

We call it the "floppy disk shuffle."

Having to boot and re-boot floppy disks every time you want to go from one application to another.

Well, the end of your shuffling is in sight.



Catalyst 3.0 with desktop icons.

Quark, Inc., will soon be shipping a unique new program called Catalyst™ 3.0 that's designed to be used with Apple II computers equipped with mass storage.

Catalyst 3.0 lets you install multiple programs on a single storage device. Macintosh-type desktop icons show you what's loaded on the program. To select the item you want, simply use an optional mouse or keyboard to open the file.

Look for Catalyst 3.0 to show up on dealer shelves soon.

Then you'll finally be able to boot all those floppies for good.

A plug for our new modem.

With the introduction of our new Apple Personal Modem, we've solved one of the biggest problems known to modems:

Where to hide them.

The Apple Personal Modem plugs directly into a standard A/C wall outlet. So unless your computer room is decorated with paisley wallpaper, it'll blend right into the

immediate surroundings.

Of course, aesthetics aside, it's also one darn good modem.

The Apple Personal Modem offers 300/1200 baud operation. Has the latest VLSI technology. Features automatic dial, re-dial and answer capabilities. Uses the industry standard Hayes AT Command Set. Plus it's totally compatible with current Apple communications software.

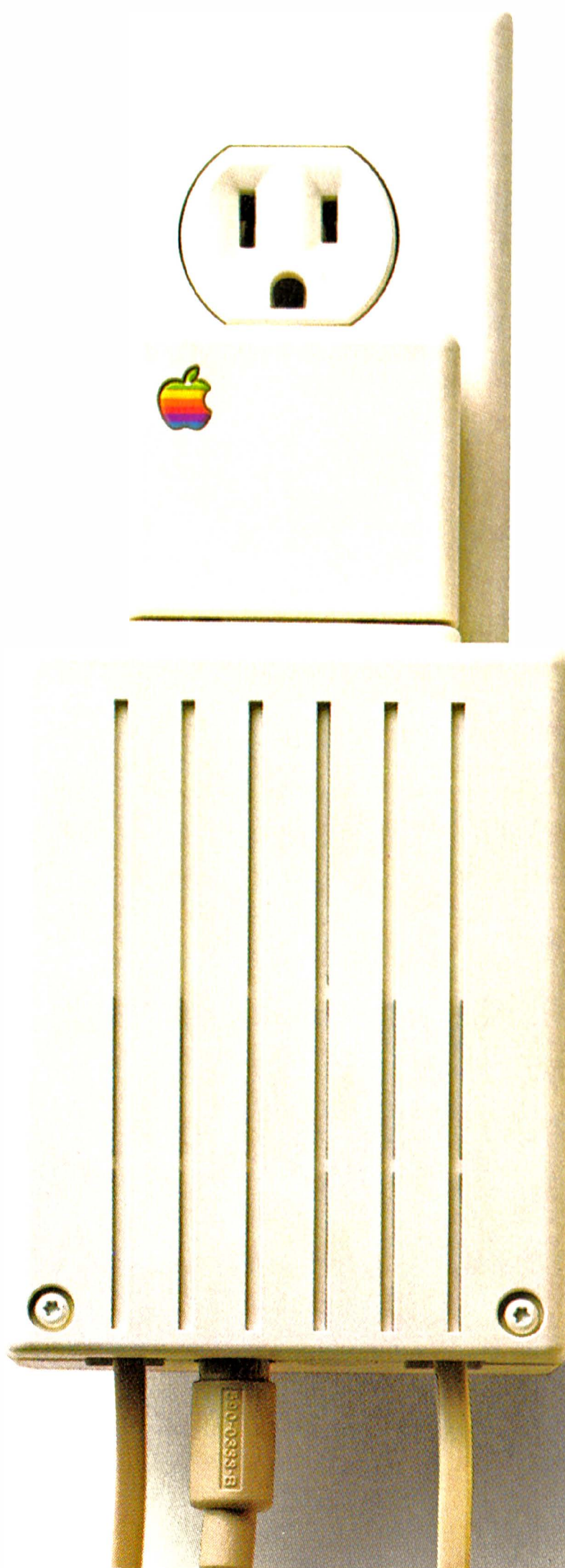
And even though we designed the Apple Personal Modem to be out of sight, there's one part of it that's definitely not:

The price.

We've increased our drive.

Our capacity for work just got bigger.

The new Apple UniDisk™ 3.5 external drive uses 3½" dual-sided microdisks to add a humongous



800 kilobyte capacity to your Apple II, II+, IIe or IIfx. Which is more than five times the amount of storage available from a standard 5¼" drive.

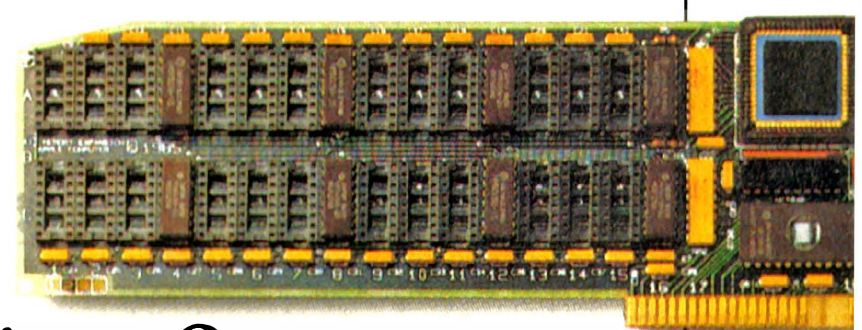
The UniDisk 3.5 is also faster than 5¼" drives. So you'll spend less time listening to that all-too-familiar whirring sound.

You can even "daisy chain" a second UniDisk 3.5 off the first one. In case you're planning to write the next great American epic or something.

As you may not know, disk drives are the most vulnerable components of any computer system. So it's nice to know that no other disk drive is closer to fail-safe than our UniDisk 3.5.

Because no other company has our dedication to quality. Our concern for reliability.

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Coming Soon: The biggest Apple IIe in memory.

The Apple II Memory Expansion Card should be on dealer shelves soon.

Before long, you'll be able to instantly and easily add another 256K, 512K, 768K or full megabyte of RAM to your Apple II, II+ or IIe. Making it one of the most powerful personal computers in its class. Or business. Or home.

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Once upon a time, most people had to dwindle their checking accounts down to the right side of the decimal point in order to buy an Apple.

Or stretch their charge cards to the place where they didn't have a choice but to leave home without them.

Then, mercifully, our finance department invented the Apple Credit Card.



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With an Apple Credit Card, you may qualify for up to \$2,500 of instant credit to spend on the Apple computer or peripherals of your choice.

And, from now until December 31st, 1985, we'll generously waive the 10% down payment.

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Have you ever felt like you needed help—serious help—with your Apple, but didn't know where to turn?

Then we suggest you join an Apple Users Group.

From Kennebunkport to Kaanapali, Apple Users Groups are springing up by the dozen.

They meet to discuss ProDOS™, Pascal and WPL. Exchange public domain software. Demonstrate new products. Listen to guest speakers.

And provide the kind of moral support that comes in handy after "Range error" has popped up on your DOS 3.3 screen for the 42nd consecutive time.

Many groups publish regular newsletters and magazines. And operate bulletin boards that let you get the information you want from the comfort of your own modem.

But the most important thing to know about Apple Users Groups, is that they're not just for hackers. In fact, most members have only novice or intermediate computing skills. Which is why they join in

the first place.

To get in touch with the Apple Users Group in your area, check with your local authorized Apple dealer.

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Computers—even Apples—can sometimes be temperamental little devils.

And if something goes wrong with yours after the 90-day limited warranty expires, you're the one who'll be out of shape.

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AppleCare is our extended service contract that covers the cost of parts and labor for up to three years. And the annual fee is usually about half the cost of a single repair.

You can buy AppleCare from your participating authorized Apple dealer. And the contract will be honored at more than 2,400 Apple dealers across the country.

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BUSINESS

Videotex in Business

*Once geared for home
and recreation, videotex is finding its real
market in the corporate world*

In today's information-driven society nothing is more valuable than relevant data. Yet corporate decision-makers are often so swamped in reports they cannot find the facts they need. Computers were supposed to automate information handling, but they have instead buried managers in reams of paper, often leaving them no better informed than their precomputer predecessors were a generation ago.

In the last year, business videotex systems have emerged as one answer to this problem. Videotex gives anyone—even without training—direct access to large computer databases. It allows managers to use their computers to search for data. Furthermore, it eliminates the need to print and distribute (and eventually destroy) paper reports, saving a considerable amount of money. Since it replaces thousands of printed copies of each report with a single electronic one, it greatly simplifies updating, making it the most efficient choice for handling volatile data ranging from branch sales figures to the corporate helicopter schedule.

For a better understanding of what business videotex does, let's look at an actual cost/benefit analysis. A large toolmaking firm recently estimated that using Honeywell Information Systems' Infonow videotex system to network its 300 retail hardware franchises would not only improve communications but also be cost-effective. The manufacturer publishes a semiannual catalog that's updated 40 times a year with flyers announcing model changes, sales, and so on. These flyers cost \$5000 each to produce and distribute, for

an annual total of \$200,000. An Infonow videotex system linking these stores would cost \$93,000 for a DPS-6 minicomputer and the videotex software plus \$650 each for 300 terminals, making a total of \$288,000. Thus the system would pay for itself in 16 months in savings on the fliers alone. Furthermore, it would allow the manufacturer to communicate instantly with its stores, provide extra information, and receive and process orders electronically.

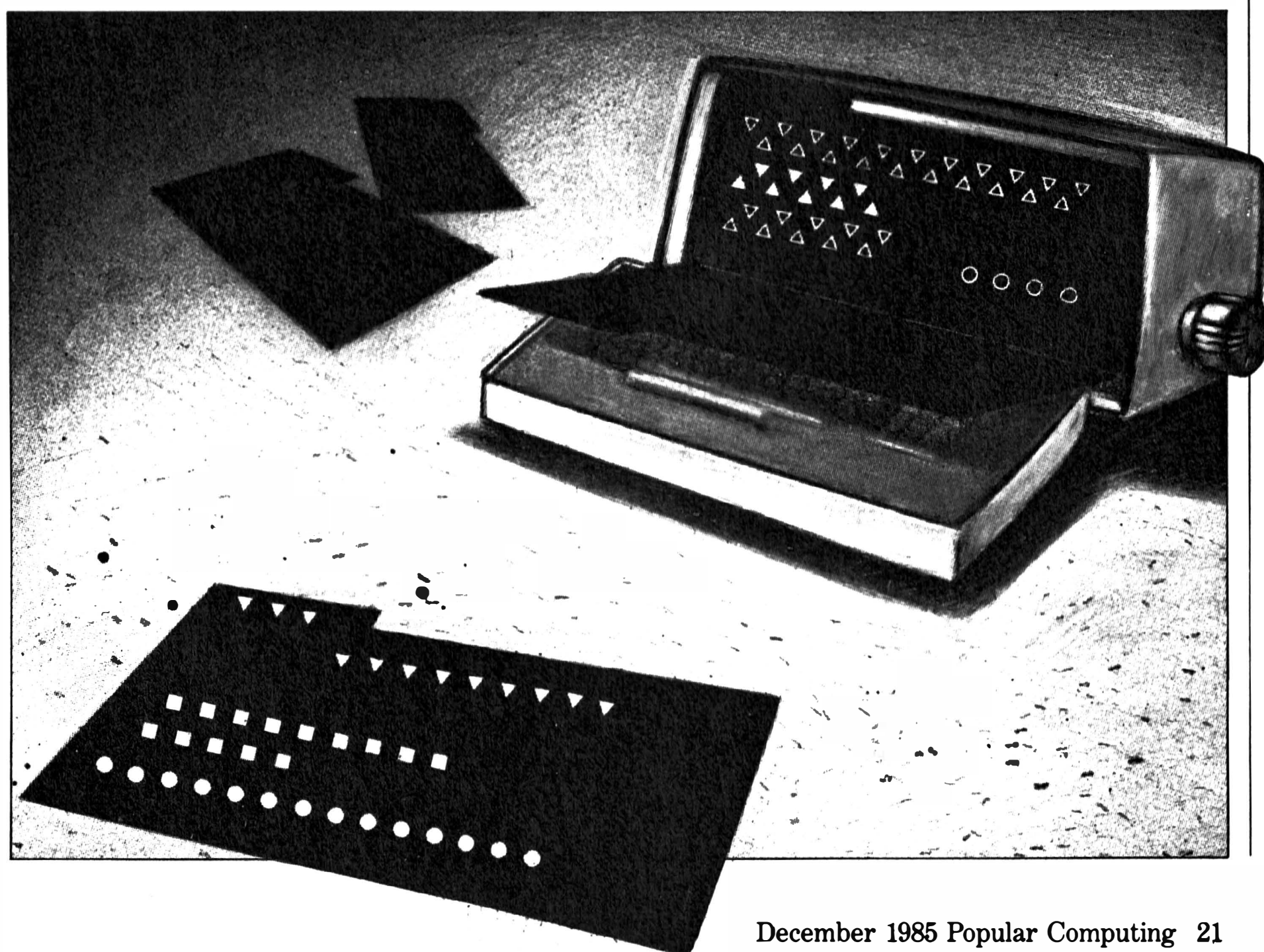
"What, then, is videotex?" asks Raymond T. Oschger, program manager for videotex with Honeywell's National Industry Operations division. "In Honeywell's view it has little to do with graphics. Videotex as we see it is a concept built on three pillars: a database structure that can be used by untrained occasional users yet provide advanced access techniques for frequent users, a set

of utility programs that allow these databases to be created and maintained by individuals with no data-processing experience or training, and a low-cost, easy-to-use terminal."

In its most basic form videotex acts as a special kind of database manager that allows nontechnical users direct access to minicomputers and mainframes. It completely protects the system from errors made by inexperienced users. Even turning your terminal off in the middle of a session will not crash the system.

Videotex systems are tailored to help you get the information you need quickly without using any specialized computer commands or terminology—everything is in English. It offers the inexperienced user simple menu choices. To get the sales statistics for Hartford, for instance, you choose "sales statistics" from a master menu, then "Hartford" from a secondary menu. Once you become used to the system, you can use mnemonics to replace the menus, entering, for instance, "sales:Htfd" to get the same information faster. Finally, most videotex systems support keyword searches. Using "sales: Hartford" as a keyword, you could receive all information on sales in Hartford.

Creating a videotex database is not arduous. Videotex systems can draw on existing databases for much of their information. Often the reports you want already exist in your



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own word-processing files and merely have to be transferred and reformatted. Further, most videotex systems are designed to allow nontechnical personnel to set up databases and run the system. System operators are given a special menu of all system maintenance functions so that running the database is no harder than accessing information in it. These systems are ideal for use by nontechnical departments in large corporations or for smaller companies that lack large MIS resources. The main concern is not technical but human—organizing the information for maximum ease of access. For this reason many large corporations have entrusted development of their videotex databases to librarians rather than programmers.

Videotex, however, reaches beyond database management to allow transactional processing using programs embedded in the videotex system. In Britain, the directors of Debenhams Group, a major chain of retail stores, spend Sunday afternoons at terminals in their homes studying the chain's sales figures for the past week. These are compiled on Saturday night and made available through Infoview, a videotex system designed by Debenhams and sold in Europe and the U.S. by Disc International. The system uses preformatted pages with blanks for figures. When you access a page the system automatically fills in the blanks with the latest available figures from the corporate database, thus ensuring that you always see up-to-the-minute information.

Personal computers are becoming increasingly popular as videotex terminals, but videotex access need not be confined to the computer users in a corporation. Nearly every company has a management level below which it will not furnish individual computers, yet these lower-level managers also need data access. Videotex technology offers inexpensive desktop terminals—Honeywell imports a French terminal called the Minitel that sells for \$650, for instance. At a third the cost of a personal computer, these can be put on the desks of lower-level managers.

Transmission of graphics does not present any particular difficulties for videotex users. Most corporate videotex systems are multistandard, easily switched from one graphics standard to another, and many corporations use straight ASCII text with no graphics at all. However, companies in fields like architecture and design need efficient electronic

COMPANIES supporting videotex in the U.S. range from Honeywell, Disc, and DEC to AT&T, IBM, and two French firms, Videodial and Cap Gemini Sogeti.

graphics. Videotex answers this need by reducing images to easily handled primitives such as curves, lines, and angles. These may be stored and transmitted over telephone lines at higher speeds than complete computer displays that must be defined point by point. Thus images can be handled virtually as easily as text.

As useful as it is by itself, videotex reaches its full potential when combined with other office automation tools. A manager preparing a report on the word processor in Digital Equipment Corp.'s All-in-1 system, for instance, can jump from word processing to DEC's VAX VTX videotex system to retrieve data for the report. The manager can then incorporate the information in the report and distribute it via the same videotex system.

Videotex also can be used in conjunction with other electronic communications technologies. In fact, videotex is used so often with electronic mail that many videotex systems include this as a built-in feature. Also, gateways can connect a company's videotex system to out-

side services such as Dow Jones News/Retrieval in such a way that the external service works just as if it were simply another part of the company's in-house system.

The applications of business videotex are burgeoning. In Dallas, for instance, a potential home buyer can walk into the realty office of a large planned community and browse through a videotex database on an IBM PC XT. This electronic brochure, which shows home styles, available locations, prices, and other basic information, helps customers determine what they want so that the time they spend with the salesperson is more productive. Stand-alone systems like this use micros as host computers, cost about \$10,000 total for hardware and software, and can drive up to five terminals each. They allow a small company to create its own videotex system with all the advantages of a large corporate system. Current suppliers of micro-based videotex systems include Videotex Systems (Dallas, TX), Digital Equipment Corp. (Maynard, MA), and Disc International (Stamford, CT).

Videotex is just beginning to appear in offices, but its future is already assured. Its potential is amply testified to by the list of companies supporting videotex systems in the U.S. Besides Honeywell, Disc, and DEC—which has built the world's largest videotex system, spanning three continents—the list also includes AT&T, IBM, and Videodial and Cap Gemini Sogeti, two French companies with offices in New York.

With this range of suppliers, videotex will very likely become commonplace in offices over the next few years; filing cabinets and printed business reports may eventually disappear. The next time you need a particular statistic, you can forget about hour-long searches through volumes of computer printouts and let your computer serve the facts you need within seconds on an electronic silver platter.

—G. BERTON LATAMORE

G. Berton Latamore, editor of the newsletter *Video-Print*, contributed "Clever Cards" to last month's *Popular Computing*.

AT LARGE

Graphic Communications

NAPLPS could be the passkey to the graphics Tower of Babel

You have created a work of art with your IBM PC: a deeply moving graphic illustrating your company's growth in the last quarter. Beaming with satisfaction, you display it for the accounting staff on their Macintosh, only to have them spot errors in your data. You plod home to modify the chart on your Apple IIe after dinner, and the next day, spirits restored, you dispatch the finished chart to headquarters where it will be displayed and printed for the company's top officers—on a DEC Rainbow. Impossible? No longer.

Although different computers can transfer text files by phone or in some cases via a disk-conversion utility, until recently, graphics files could not be exchanged easily. Each brand of computer has its own set of graphics commands, incompatible with all the others.

But thanks to a new standard, the passkey to the graphics Tower of Babel may be at hand. Software is now available to let IBM PCs and compatibles, Macintoshes, and several other kinds of computers share the exact same graphics files.

"Revolutionary," you say, "why haven't I heard about it?" But you have. Remember videotex? A couple of years ago, Sunday supplements proclaimed it the latest consumer miracle, poised to turn our home TV sets into color-graphic fountains of information. In reality, the consumer market has been slow to embrace videotex, though a number of major companies are still betting on it to make good in the long term.

Meanwhile, it turns out that videotex standards handily overcome the graphics incompatibility between different makes and models of per-

sonal computers. In fact, the engineers who set these standards had something much bigger than videotex in mind all along. They aimed at nothing less than universal exchangeability of computer graphics.

The vehicle they created is called, in the best engineerese, NAPLPS (pronounced "nap-lips"), an acronym for North American Presentation Level Protocol Syntax. It plays the same role for graphics that the venerable ASCII standard does for text. In fact, compatibility with ASCII is maintained, even when ASCII text is sent to a NAPLPS machine.

The innovation in NAPLPS is simply to allow new interpretations of the bytes in the ASCII character set, thus vastly extending what they can do. To the old set it adds foreign language and scientific characters, custom characters, font sizes, block graphics, high-resolution graphics, and color, with room for expansion into three-dimensional drawings, audio, and full animation.

Designed to travel over ordinary phone lines, NAPLPS achieves remarkable economy of data. It typically stores a graphic image in one-sixth the disk space of a traditional "bit map" file. An hours-long NAPLPS slide show fits on a single floppy disk, and a full screen of graphics can be sent from one computer to another in a few seconds at 1200 baud. Despite their added capabilities, NAPLPS files are treated just like ASCII text files by computers; they are transmitted and stored in the same ways.

Used so far mainly in a few graphics databases, NAPLPS is potentially a vehicle for person-to-person

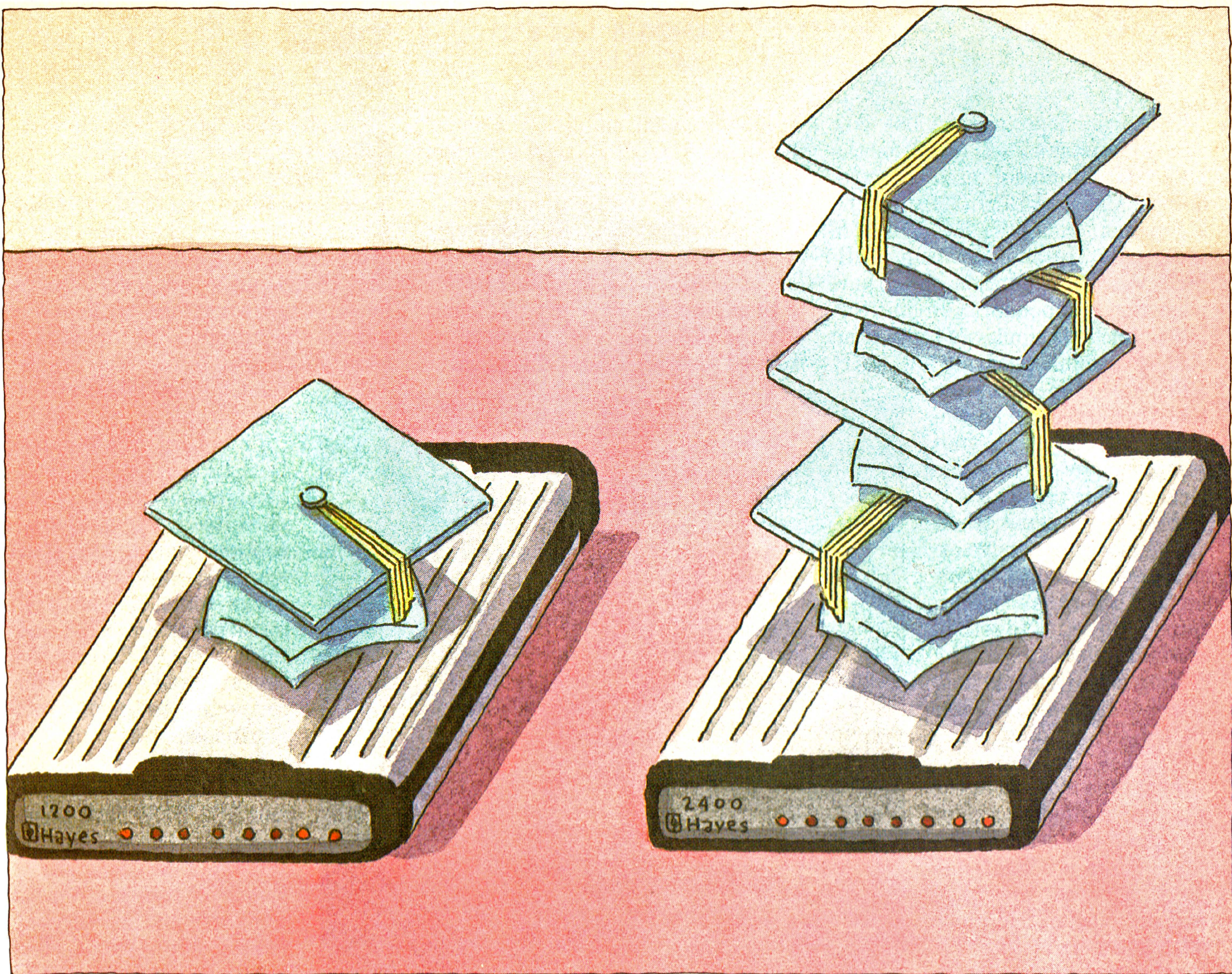
graphic electronic mail and even graphic conferencing. An architect could electronically mail a sketch of a building concept to his partners. A computer conference for engineers could include on-line renderings of designs in progress. Managers of banks, industrial plants, and supermarkets could generate performance charts on their micros and transmit them to headquarters. No one would have to worry about what kind of computer is making, sending, or receiving the file.

In fact, no less an entity than Digital Equipment Corp. (DEC), the world's second-largest computer maker, supports NAPLPS right now for graphics communication on its vast internal network of mainframes and micros.

But wait a minute. We microcomputer users have seen more than one technological promise come to nothing; we have every right to be skeptical. In this spirit, a few months ago, I set out to gather a variety of microcomputer NAPLPS programs and make them actually talk graphics to each other.

First I had to learn some nomenclature. In the familiar ASCII world we use word processors to create text files and terminal software to send and receive the files. In the NAPLPS world, programs fall into similar categories. The graphic files are often called frames or pages, and we use a typical paint program to create them. The process of storing them is known technically as encoding, and the software or hardware to reconstitute the code into a display is, logically enough, a decoder. A NAPLPS terminal program is sometimes called an on-line decoder.

To make pages, I used Prodraw, by Limicon, a \$160 paint program that runs on IBM PCs and compatibles. It performs much like a scaled-down Macpaint, with keyboard, mouse, or graphic-tablet input. There are a number of other NAPLPS page-creation programs that I could have used, some with many more features and prices extending into the \$2000 range. I chose Prodraw for reasonable performance at a rock-bottom price.



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The terminal programs I looked at were Microstar's P+II (\$160) for the IBM PC, Compaq, etc., Electrohome's MacNAPLPS (\$99) for the Macintosh, and SOFDEC (\$160) for the Apple IIe and IIc from FORMIC Videotex. All these programs have two components: on-line terminal functions similar to those of an ASCII terminal program and NAPLPS decoder software that translates the incoming NAPLPS bytes into commands for the specific local graphic display, be it IBM, Mac, or some other.

The most impressive experiment I tried was hooking an IBM PC and a Macintosh directly together, modem-to-modem, and invoking P+II's Send-and-Display-Page option. The PC began sending out a NAPLPS file from disk through the modem, at the same time building a color image on the screen. The Mac running MacNAPLPS received the page and also displayed it, much as a black-and-white TV set displays a color broadcast. Thus I was able simultaneously to see the same graphic on the two great incompatibles, the IBM PC and the Macintosh.

Using the Mac mouse I then selected Capture Page from the pull-down file-command menu and copied the file just received from the IBM to the Mac's disk. Finally I selected Print Page, and the Mac's ImageWriter printer took about 60 seconds to render a bit-perfect hard copy of the same frame. I repeated the overall experiment with a variety of graphics: pages I made myself with Prodraw, such as a Chamber-of-Commerce-type map of neighborhood businesses, a demo frame supplied with P+II that writes Arabic on the screen (from right to left, as Arabic should be written), and charts captured from CompuServe.

CompuServe? Yes, though it hasn't

received much publicity, CompuServe has a NAPLPS page-generator linked to its securities quotation database. If you're a subscriber, poke around in the financial research menus, and you'll see it. For 50 cents added to your bill, it will draw you a week, month, or year trend chart for the issue of your choice. I retrieved several of these charts, saved

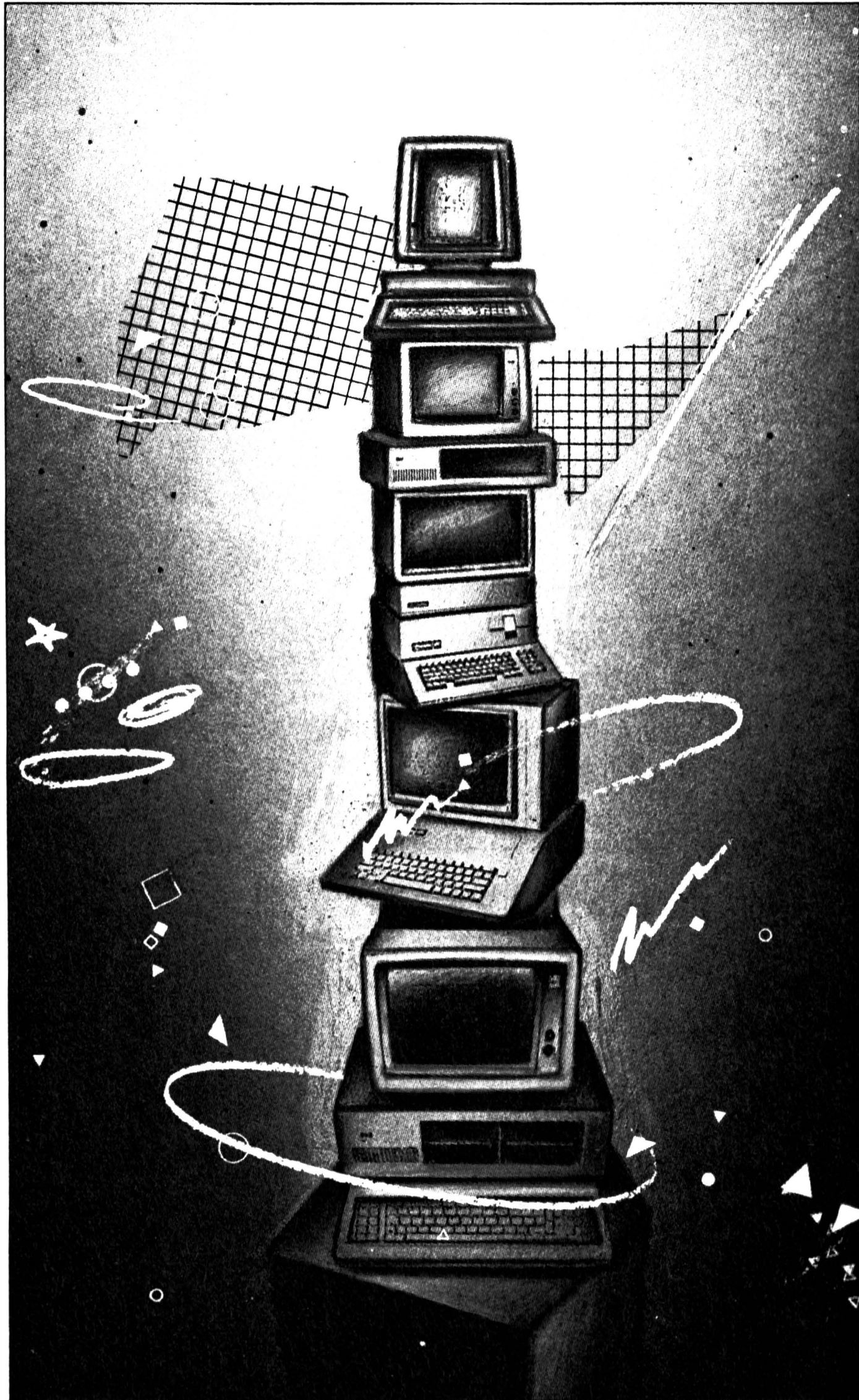
For starters, 100 percent compatibility is not here yet. As with any new technology, there are a few loose ends to be tied up. In moving frames between unlike computers I spotted the occasional line of text that didn't space properly on one machine or a color that disappeared into the background. But most material did translate cleanly—the inconsistencies were minor and curable.

The big hurdle for NAPLPS is not any technical defect in the standard itself, but a misconception among the software developers who wrote some of these terminal programs. They still think of NAPLPS in videotex terms, as a medium for retrieving graphics from databases but not for person-to-person interaction. Thus MacNAPLPS and SOFDEC have page-capture capability but no command to send out a page from disk to a remote computer. In their present receive-only versions, MacNAPLPS and SOFDEC don't quite live up to my opening scenario.

Likewise, the creation of NAPLPS pages is seen by software houses as a function of the professional providing information to a database, not the average microcomputer user sending graphics to colleagues and friends. Too much NAPLPS page-creation software is priced in the thousands of dollars by makers expecting to sell

relatively few copies in an industrial market.

Pointing to a new way are Microstar with P+II and Limicon with Prodraw. Limicon priced Prodraw to sell against the legion of medium-to-low-priced programs like PC Mousepaint or Chart-Master. Microstar, focusing on the two-way potential of NAPLPS, made P+II a full smart-terminal program with the ability to send files as well as receive them. Moreover, they gave it a straight



them to the PC disk, printed them, and moved them to the Macintosh.

I admit it: I'm in love with the idea of 100 percent standard graphics we can all share without worrying about what make and model of computer we own. Furthermore, my work with these NAPLPS programs has convinced me that the ideal is attainable. But I must be frank about what these programs don't do—yet.

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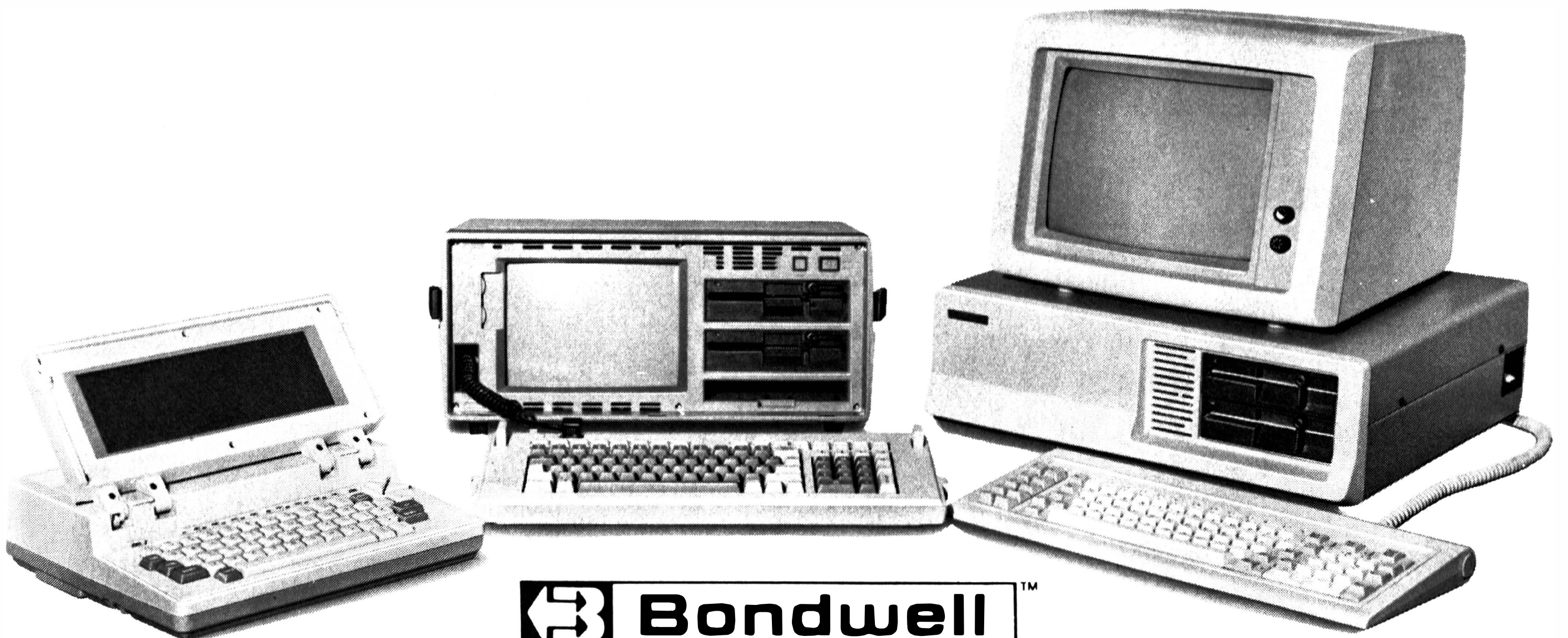
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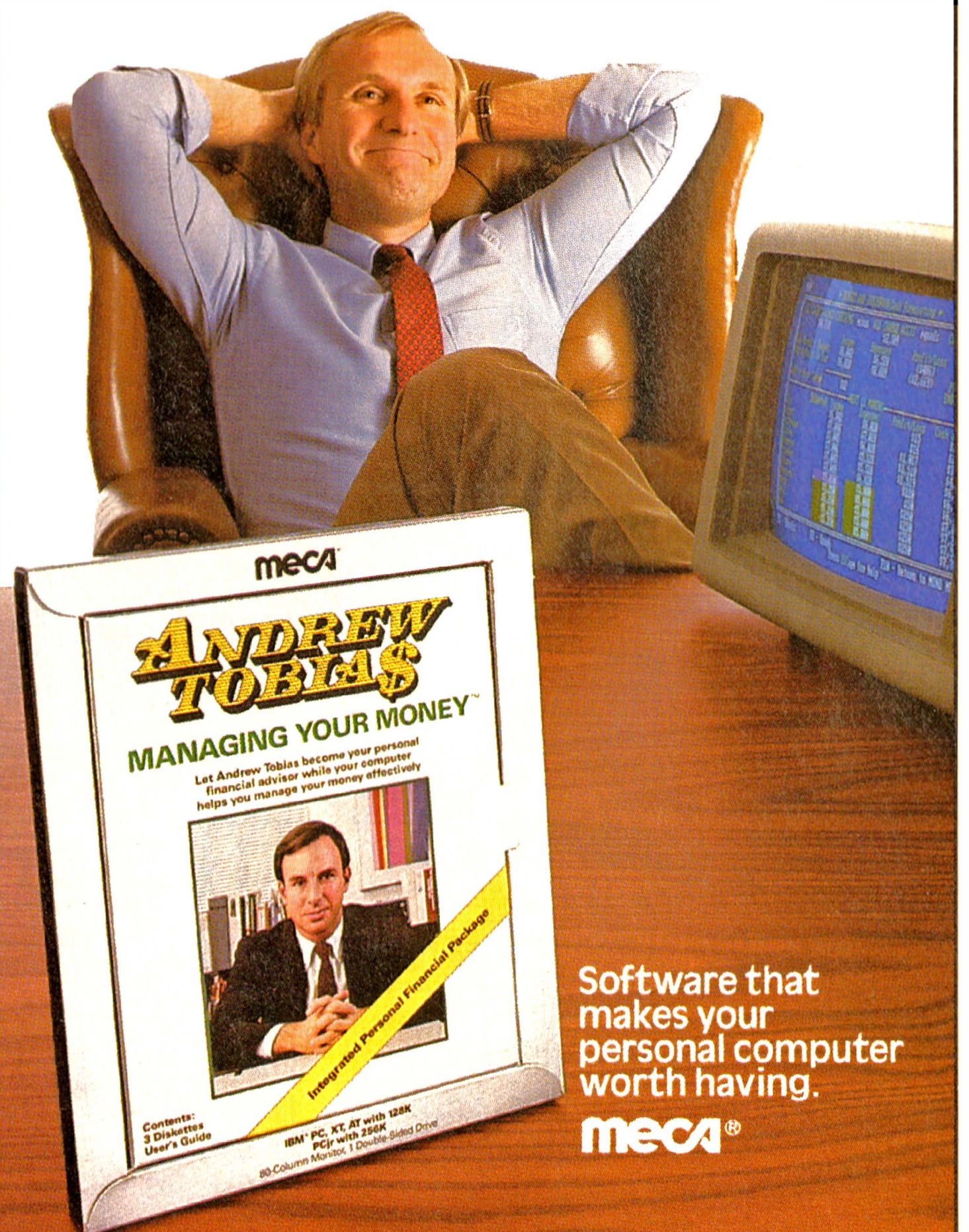
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ASCII mode, selectable at the touch of a function key, in which the program functions much like nongraphic software such as PC-Talk or Smartcom II. Thus the user can cover text and graphic communication needs without having to buy two programs.

In the text-based era of computing that's now drawing to a close, ASCII made universal text exchange possible. Macintosh and now Amiga typify the dawning era of graphics-based computing, in which NAPLPS could make universal text-and-graphics exchange possible. But to realize this great potential, the cur-

rent trickle of compatible software must grow into a flood. NAPLPS software developers must shed their videotex blinders and compete feature for feature with popular graphics and terminal software that have already appeared on the market. When we have NAPLPS-based programs as good as, and priced the same as, their nonstandard counterparts, then the freedom to share files among all computer makes and models will become a major selling point and the ascent of NAPLPS can begin.

—LOUIS JAFFE

Louis Jaffe operates Chariot, an on-line system in Colorado Springs that supports both ASCII and NAPLPS.

APPLICATION

Harder Than 1-2-3

Symphony's power comes at the price of complexity, especially in setting up a database

For many Symphony users, only one sour note spoils the program's performance: the database. Even former 1-2-3 owners, who easily adapt to Symphony's more sophisticated spreadsheet and graphics commands, often find the database inaccessible. Others simply ignore it altogether, concentrating on Lotus's powerful spreadsheet—the reason they bought the software in the first place.

Setting up a Symphony database is not difficult, but it is complicated. Instead of guidance, the program's endless menus provide endless opportunities for wrong turns in what seems like an overly elaborate maze. But if you are conducted through it, you'll find the journey makes sense, isn't too long, and is probably worth the trip—even if you aren't sure you need to take it.

Let's walk through a simple but illustrative example. Suppose you want to keep track of products your company sells, including sale date, quantity, and price. During the year,

you'd also like to reorganize this information to show the income each product generates and what sells best during which months. In 1-2-3 you'd start by typing everything into the spreadsheet, but in Symphony you create a "fill-in-the-blanks" form that allows data to be entered and viewed one record at a time, as if on individual index cards.

To the confusion and surprise of many beginners, you don't start creating an entry form in the FORM mode, but in the SHEET environment—the backbone of all Symphony operations. To set up a new spreadsheet, you type the following in cells A1 through A5:

```
A
1 DATE:D
2 PRODUCT:L:15
3 PRICE
4 QUANTITY:7
5 TOTAL:C
```

The words DATE, PRODUCT, PRICE, QUANTITY, and TOTAL are the categories (or fields) for the form that

Symphony will be generating. The letters represent field types: D for "date," L for "label," and C for "computed." The numbers 15 and 7 specify how long the PRODUCT and QUANTITY blanks should be. You don't need to put a letter and number by all of the fields because you'll set default types and lengths later.

Now you can switch into FORM mode. To do this, hold down Alt and hit F10. On-screen you will see: SHEET DOC GRAPH FORM COMM. Choose FORM by hitting F.

The screen goes blank, and a discouraging message appears: "No Definition range defined." But don't turn back—you haven't done anything wrong. You'll understand what a Definition range is after you've created your form.

Hit F10, which calls up the FORM mode menu: Attach Criteria Initialize Record-Sort Generate Settings. Since you want Symphony to generate an entry form automatically, hit G. Now more choices appear: Label Number Date Time Computed. Symphony is prompting you to enter the default field type. Hit N.

This will set up PRICE, QUANTITY and TOTAL fields to be numeric (you have already specified PRODUCT and DATE formats). Next you're asked for the default field length—9 is already on screen, so by hitting Return you can make the DATE, PRICE, and TOTAL entry blanks 9 spaces (again, you have already set PRODUCT and QUANTITY). Now you're asked to name the database. Type Product Sales and hit Return. Suddenly, the spreadsheet returns.

Symphony put you here because it must know the range of your entry fields. All you have to do is highlight your field names (check to see that the menu bar reads A5..A1) then hit Return. Automatically, Symphony switches back to FORM. On your screen you see this:

Inserting Record 1 New Record
FORM

Enter DATE

DATE _____

PRODUCT _____

PRICE _____

QUANTITY _____

TOTAL _____

PRODUCT SALES _____
MAIN

15-Nov-85 12:17 PM
Calc CapNum

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At last, the entry form has been created, and now you could actually begin typing in your data. But let's do a little fine-tuning. To make today's date appear in the form and transform two of the fields into currency format, you must return to SHEET. Use Symphony's Switch command: while holding down Alt, hit F9—and try to keep your jaw from dropping. Your spreadsheet now looks like the layout shown below.

Beginners, especially those unfamiliar with 1-2-3, will find this sight rather confusing. What you see are the ranges that the Generate command created. Symphony uses these to produce the proper form and to execute queries and reports. But at this stage, all you need to use is the Definition range (A14..H18), which will control the interaction between the form and the database. First let's make PRICE and TOTAL appear in currency format. Move to B16, the intersection of the PRICE row and VALUE column. Hit F10, F, C, and, for 2 decimal places, Return twice. Drop down to B18, the TOTAL row, and follow the same sequence.

To set the date, move to the intersection of the DATE row and the DEFAULT column (cell D14). Type this: @INT(@NOW). You'll probably want to widen the column: F10, W, S, 10, Return.

Next, enter the formula that will multiply the PRICE and QUANTITY values. Since the answer must appear in the TOTAL field, move to cell E18, the intersection of the TOTAL row and FORMULA column. Type +B16*B17 (a zero will appear).

Now let's take it for a spin. Switch to FORM (Alt-F9) (notice that the date you typed when DOS was loaded is already on the screen) and hit Return.

The cursor jumps to the PRODUCT field. Type Widget and hit Return. The cursor now moves to PRICE. Type 159 and hit Return—the entry automatically appears in currency format. At the QUANTITY prompt, type 3 and Return. Instantly, the total is calculated. Hit Ins, and record one is entered into the database. The form clears, ready for another.

This time, change the date. Enter 10/10/85. Automatically, it's trans-

formed into the familiar Lotus date format. At PRODUCT, type Super-Widget and hit Return. Type 259 and Return at the PRICE prompt. Enter 2 at QUANTITY. Once again, the TOTAL is calculated.

If you want to change any of the entries on the screen, either position the cursor with the arrow keys and overstrike old entries or hit F2 to go

I
IF YOU
need to examine,
manipulate, and
print your spread-
sheets in different
ways, you'll find the
database functions
invaluable.

into edit mode. Hit Ins to place record two into the database.

After you've entered five or six more records, try the cursor keys. Home returns the first record; End puts the last on the screen; PgUp moves you back one record at a time; PgDn moves you forward.

Before you continue adding records, return to SHEET mode. Use

Switch (Alt-F9). At the bottom of the screen you'll see Symphony's database range beginning in cell A28. Here, your data is arranged in rows—in spreadsheet format. As you were entering data into FORM, it was automatically being dropped into SHEET—undoubtedly, one of Symphony's most valuable features. Some companies have found the upgrade from 1-2-3 worthwhile for this feature alone.

You can work in FORM, viewing only one record at a time, or switch to SHEET to see the entire database. Sorting and querying are available in either environment. You can also copy data to other areas for further analysis or calculation. If you need to examine, manipulate, and print your spreadsheets in several different ways, you'll soon consider the database functions invaluable.

But more hurdles await you. You still need to learn how to sort and query the database, and you'll want to learn how to set on-screen ranges. Perhaps, after all, you're a 1-2-3 user who has just discovered that Symphony is more than you want to tackle. However, if you continue to use Symphony's database, you'll probably agree that despite its complexity, within the confines of an integrated package it's a very versatile tool. —SETH GREENBERG

Seth Greenberg teaches classes in business applications software.

THESE ARE DATABASE RANGES CREATED BY THE GENERATE COMMAND.

The screenshot shows the Symphony 1-2-3 interface. At the top, it lists database ranges: DATE:D, PRODUCT:L:15, PRICE, QUANTITY:7, and TOTAL:C. Below this is a form with input fields for DATE, PRODUCT, PRICE, QUANTITY, and TOTAL. The main part of the screen displays a spreadsheet with columns for Name, Value, Type, Default Formula, Validity Input, and Prompt. The data includes fields for DATE (00-Jan-00), PRODUCT (0), PRICE (0), QUANTITY (0), and TOTAL (0). At the bottom, there are more input fields for DATE, PRODUCT, PRICE, QUANTITY, and TOTAL.

Name	Value	Type	Default Formula	Validity Input	Prompt
DATE		D:9			Enter DATE
PRODUCT		L:15			Enter PRODUCT
PRICE		N:9			Enter PRICE
QUANTITY		N:7			Enter QUANTITY
TOTAL		C:9			Enter TOTAL

DATE	PRODUCT	PRICE	QUANTITY	TOTAL
00-Jan-00	0	0	0	0

DATE	PRODUCT	PRICE	QUANTITY	TOTAL

Send Me No Abstract

A few months ago, I was doing some research on a database called the Magazine Index. It's a great service: up-to-date listings of articles in over 400 publications, cross-indexed by subject and author. The database is available electronically through services like Dialog, but I was using it in my local branch of the New York Public Library on one of those fast-paging microfilm machines. As I zipped through the alphabet, my eye was caught by a familiar name: my own. This was purely by chance, mind you, and I was about to race on when I spotted, among the various citations of articles I had written, something besides the titles, publications, and page numbers. One of the citations had a letter grade.

Now, this happened not long after I had published a book titled *Hackers*. After looking at the screen for a minute, I discovered that this letter grade was not an evaluation of a magazine article I had written but referred to a review of my book. What seemed odd was that the original review—which I had seen—had not been embellished with a letter grade. Somewhere between publication and listing in the database, however, a letter grade had appeared. The review had appeared in *Publishers Weekly*, and I had thought it a pretty good one. The letter grade in the Magazine Index, though, was only a C-plus—a grade I never liked to see on my scholastic efforts and certainly not in a database reference to my book.

Being a live-and-let-live kind of

*In the world of databases,
there's the danger that snippets
will supersede sources*



guy, though, I shrugged this off as some anomaly and continued my research.

A few weeks after that I was at one of those deadly morning press conferences you sometimes find yourself attending if you write a computer column. Standing by the coffee dispenser, I noticed someone trying to read the name tag that had been pinned on me earlier. When this fellow saw my name, he gave a nod of recognition and told me that he had enjoyed my book. In fact, he added, he had even reviewed it for *Publishers Weekly*.

Then I remembered that database. "Let me ask you a question," I said. "If someone were to read your review and try to figure out what let-

ter grade you were trying to give the book, what letter grade would it be?" He looked a little puzzled but finally said it would be something like a high B.

I told him what I had seen in the Magazine Index.

"A C-plus?" he said. "No, that's not right at all."

Time to Reflect

As you can imagine, that got me to thinking about this practice. It is a particularly relevant time to stop and consider it because we are about to experience an explosion in databases. Not only the proliferation of computers and modems but the introduction of CD-ROM disks (those are the laser disks that hold literally billions and billions of bytes of information) are factors in making database searches a commonplace activity.

Even though we have more storage space, the problems of time consumption and copyright make paging through the full text of items prohibitive. Yet often just reading the title of an article or study does not provide sufficient information to judge whether it's worthwhile to look up the whole thing. Increasingly, people are going to want questions answered right there in the middle of a database search.

For many purposes, the solution is some form of abstracting. When you ask for articles on a certain subject, you get not only information on where you might find the article but also an idea of what's in it. This

Steven Levy is a New York-based contributing editor of *Popular Computing*.



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For the user, this represents quite a saving in time and energy. But there's a problem in this. Getting a mere abstract or summary of events is never the same as reading the full text.

In some cases, it makes no difference. For instance, if you were using a database to find out how many personal computers were sold in 1983 and you found an abstract explaining that "this article reveals that two million personal computers were sold in 1983," you've gotten all you wanted from the article without having to look at it.

Incidentally, this example illustrates some thorny copyright questions. Writers of articles—or reviewers of books—put a lot of energy into their work and are entitled to certain protections against having their labors duplicated without permission—or remuneration.

Apparently, this is a hot issue in the abstract business. The proper procedure for abstracting is to report what's in an article or review—for example, "The article talks about the gross national product growing 5.9%." This is called *indicative* abstracting, and it apparently falls under the "fair use" provisions of the law, which means that it's OK. The other side of the coin is *informative* abstracting. In that case the phrasing would be "The gross national product grew 5.9%."

I gleaned this information in a chat with Maury Goldberg, the president of Information Access, the company that runs the Magazine Index and several others. My reaction was that there seemed to be a fine line between indicative and informative abstracting. He agreed and told me that in one of the few legal cases concerning the problem (one in which his firm was not involved), the judge ruled that the deciding factor was

whether the abstract "sucked the marrow from the bone"—in other words, if it obviated the need for the article itself.

An Added Bonus

That led me to mention the practice of giving letter grades to reviews. Magazine Index, Goldberg confirmed, does this not only for

IS THE
practice of giving
letter grades or
stars really fair
to works under
review? Even the
reviewers disagree
on that question.

book reviews but reviews of restaurants and movies as well. Magazine Index, he explained, is for all other purposes an indexing service, giving no descriptions of the contents of articles beyond the title and general subject. The letter grade is an innovation on behalf of Information Access, sort of an extra added bonus to readers. "We try to differentiate our product from other databases," says Goldberg. "Since we have to read the reviews, we figured why not provide this service?" He admitted that the grade would allow the patron to get the point of a review without going to the review but noted that there's no legal problem here—"We consider the grade to be an original intellectual contribution"—and I would certainly agree that he's not trampling on anyone's copyright.

Still, making judgments like that is quite a responsibility. For the question as to how the judgments are arrived at, he suggested I talk to his vice-president in charge of editorial services, Delores Meglio.

I did that. Ms. Meglio described the steps that one of her workers goes through when handling a book, movie, or restaurant review: "Basi-

cally when a review is indexed, the person doing the work reads the review and goes through the steps in indexing it. If the review indicated the work (the book, movie, or restaurant) was exceptional, or super, he or she would give a high grade." Anyone who's been to school understands these grades, of course. Using Magazine Index's terminology: A is excellent, B is Good, C is OK, D is Not Very Good, and F is Terrible. At a glance, you can tell the value of something.

Or can you? A continual debate in reviewing circles is whether or not the practice of giving letter grades—or one-to-ten-scale ratings, or "stars," which amount to the same thing—is fair to the work reviewed. A lot of effort goes into opening a restaurant, making a movie, or writing a book. These are complex ventures, which almost always have certain strengths and weaknesses. How can you say you are fairly rating something by slapping a grade on it? And how can you be sure that one person's B means the same as someone else's? It was for these reasons that *Rolling Stone* recently dropped the "star" rating on its record reviews. "What one person considers four stars might not be the same as another person's opinion," explains *Rolling Stone* music editor Jim Henke. "But the biggest objection was the reviewers themselves thinking it's unfair."

I remember discussions about complaints like that when I was a teacher of composition in a large university. Our students would always tell us that the same essay handed in to one teacher would earn a different grade with some other teacher. Once the entire English Department did an experiment to see if there was truth to this. While there were very few cases where one teacher gave a D to the same essay that another teacher thought was an A effort, there were plenty of cases where people not only disagreed but felt strongly that their grade was correct.

Judgments Twice Removed

What the Magazine Index does is even more tricky. The people assigning grades are not basing their judg-



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ments on the work itself or even on the review. The grade is based on their judgment of what the original reviewer *would have* graded the work if the review had contained a grade. Got that? In other words, a publication may make a conscious effort not to give letter grades or stars to reviews, thinking them unfair—but the Magazine Index will press on and tag a grade on the review anyway! (If there is a letter grade that the original reviewer assigned the work, says Ms. Meglio, the Magazine Index will use it.)

Are They Experts?

I wondered if the people who take on the responsibility of giving these grades have any particular expertise in the arts or at least in the art of reviewing. “No,” says Ms. Meglio. She implies they don’t need any because “they’re not evaluating anything.”

I would disagree with that: they *are* evaluating. That’s what a letter grade is all about. That’s why people like to see them—they are fearless. They lay things on the line. They give an instant answer to the questions “How good is it? Is it worth my time and money?”

But you really aren’t doing people a service unless you give reliable ratings. Jim Henke of *Rolling Stone* says that a lot of readers complained when they dropped the stars from reviews. But previously, he says, readers would buy an album that rated four stars without even reading the review. When they finally got around to playing the record, they would often find themselves disappointed.

So how well does the Magazine Index do in its ratings? Rating the ratings is too mammoth a task to undertake. But using reviews of my book as an unscientific sampler, I can report that the Index gives one a good idea of how reviewers treated me (at least in my opinion). I would concur with about two-thirds of the Magazine Index’s guesses at what the critics would have said if they were pinned to the wall and forced to give a letter grade. In one or two cases, the Index gave me a break; in a couple of others I thought that its grades were overly harsh. But then,

my opinion doesn’t matter, really—the ones with valid complaints would be any critics who actually reviewed the book and disagreed with the grade that the Magazine Index had assigned to them.

I fall into that category too, because included among the citations under my name in the Magazine Index is a review that *I* wrote about a book that provides hints to solve adventure games. I called the book a “valuable tome,” said the book was not only less expensive but wiser than others in its category. I would have rated the book an A-minus if I had given it a letter grade. Yet the Magazine Index had assumed that my grade for the book was a D! This bothered me more than possible misjudgments in the reviews of my own book. Here was a case where either the indexer had poorly read and misjudged my review—or I had written the review so poorly that a reader couldn’t tell if I thought the book was any good or not.

When I asked Ms. Meglio if her department had ever had any criticism for either the practice of giving letter grades or any specific grades they had given, she answered in the negative. So I asked what the Magazine Index *would* do if a complaint came in.

It All Depends

She told me that she couldn’t answer that question unless she received a specific complaint, and in that case it would be reviewed on the basis of that particular situation. I asked what criteria they would use to judge the case. I assumed that the most compelling complaint could come from the original reviewer of the work. If a reviewer complained that the Magazine Index had implied he hated the work when he actually loved it, how would the Index go about deciding whether to change the grade? On the basis of the reviewer’s word? Or by taking another look at the written review?

Ms. Meglio said she could not answer even a question about what criteria the company would use in evaluating a complaint: it would all depend on the specifics of the situation.

Realistically, we cannot expect too

many complaints of this nature to arise. In my own case, quite frankly, it wasn’t worth the trouble to me to press the case. Compared to more dire problems, the question of how one assigns letter grades to reviews is relatively innocuous. At worst, a few people may not buy a book that a reviewer, unbeknownst to them, urged them to buy. Or some people would see a movie mistakenly thinking that a reviewer recommended it, when actually the reviewer didn’t think much of the film. The bulk of the grades are obviously reasonable, since the Magazine Index workers, like most of us, are well able to tell a pan from a rave.

The Summary Is All

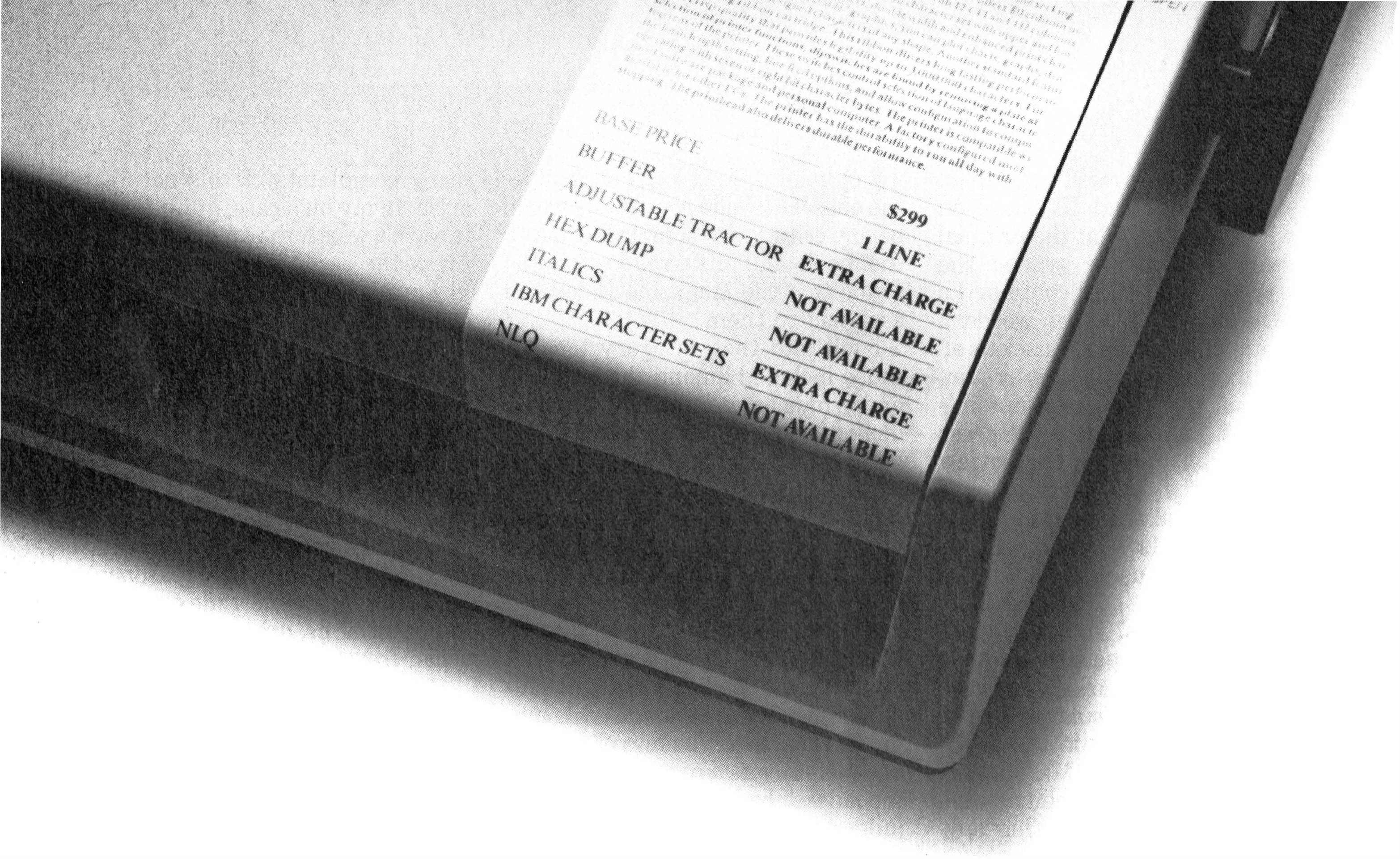
Yet the situation is indicative of a larger problem. As we see more and more of these databases, and the pressure to be “innovative,” as Maury Goldberg puts it, increases, we may see more and more capsulizing at the expense of encouraging people to get the full text of things.

These snap judgments—actually judgments of other people’s judgments—will be immortalized in ROM disks that presumably are authoritative. They may even outlast the original reviews—the letter grade may be all that is left. We will be distanced from the actual opinions, unable to access the reviewer’s feelings and certainly the reviewer’s sensibilities. Likewise, the abstracts of articles—whether informative or indicative—may well be so much more readily available than the originals that the summary of the product will stand for the product itself.

Who is going to verify these abstracts? What guarantees do we have that they provide a reliable indication of what exists in the article itself? And what procedures will the information vendors institute to insure that any complaints about the abstracts will be dealt with effectively? If you know of a database that provides these answers, let me know.

And please: send me no abstract. □

Steven Levy welcomes your comments and suggestions. You can contact him on The Source (ID TCT670) or CompuServe (ID 72065 635) or by writing to him c/o *Popular Computing*, POB 397, Hancock, NH 03449.



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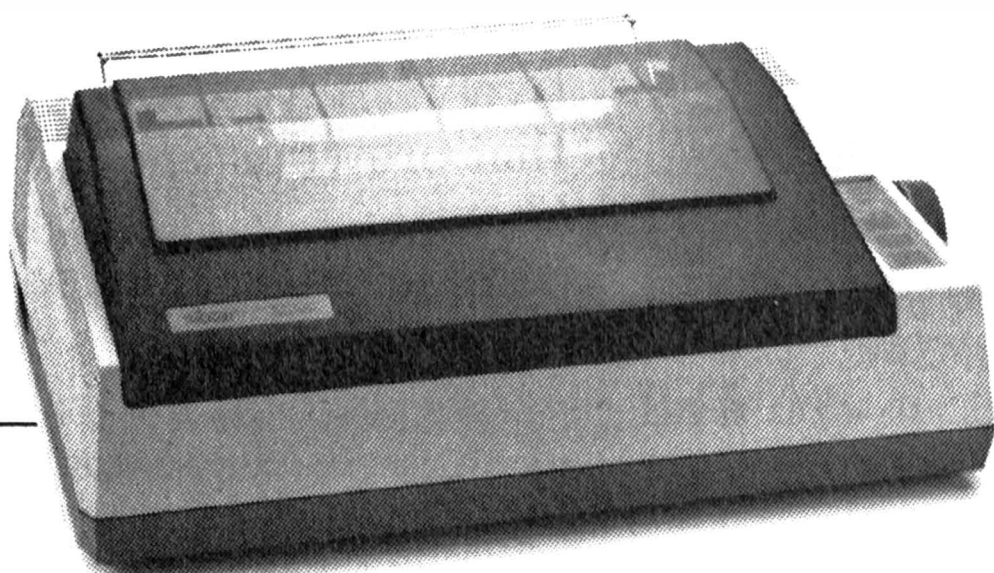
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Grasping the Power of CMC

Getting information nowadays is not a problem; indeed, the real difficulty is that there's too much. Wherever we go we are bombarded with data. Some of it is useless. Tiny bits here and there are important but lost in the noise. It's no use pretending that the problem isn't real. Most of us are threatened by information overload. I don't know anyone not a total recluse who has completely mastered the problem. Help is at hand though.

Philosophers tell us that perception is organized sensation; similarly, knowledge is information organized with good judgment. Used properly, computers—which have greatly contributed to the problem of information overload—can also show us the way out of this informational thicket.

A few years ago, most of us had never heard of computer-mediated communications, but sooner or later just about everyone will become involved as much of the globe is knit together in one vast electronic village. CMC (as it's known in professional computer literature) is a splendid way to get new knowledge and organize what you already know. Properly used, it's an important tool in coping with the information society, but connecting to "electropolis" can become one of the main sources of information overload.

Lately I find myself spending more and more time on my favorite CMC system, the BYTE Information Exchange (BIX). In the beginning, everything seems new and ex-

*Getting control of
"computer-mediated communications"
demands new software*



citing. There are dozens of conferences, all interesting. I sign up for one or two. They're a bit slow. Meanwhile, important things are being said in other conferences. Better join those, too. And here's another—it doesn't take long before the number of conferencing partners mushrooms out of sight. The CMC system, far from saving time and effort, consumes most of the day. Mail goes unanswered, producing guilt, which produces anxiety. Burnout is near.

Some people drop out at this point. They shouldn't.

Clearly though, there must be some means of cutting down on information input. In particular, one must avoid "junk information," claptrap, unwanted and useless information.

What to Do

Computers are information-processing devices. The trick is to use the computer itself to organize the incoming information.

This isn't always easy. Many computer conferencing systems aren't well designed. Everyone can get at everyone else, and often does. This is compounded when most of the users are new to the CMC environment. When conferences begin, for example, every member feels compelled to respond to nearly every message. The result is an endless series of trivial exchanges; expressions of agreement, disagreement, or disgust; supposedly clever one-liners; useless theorizing; and outright babble.

Fortunately this is self-limiting. The remedy here is to wait it out. Most users will see what they're

doing, and peer-group pressure will teach the others.

However, even after most communicants on CMC systems have learned to cope, there will remain irresponsible individuals who never do learn. My own experience has been that about 90 percent of the electronic junk that I get on BIX comes from three or four individuals. If I put off or avoid reading their "contributions" I'm not going to miss much, and I save time and avoid stress.

Proper organization and screening are the keys to effective use of CMC systems. This is easy to understand

Science fiction writer Jerry Pournelle, who joined the micro revolution eight years ago, is a contributing editor of *Popular Computing*.

intellectually, but I didn't grasp the full importance of the screening concept until I was actually confronted with electronic junk. That encounter got me thinking about conferencing software.

Customizing Communications

There are two ways to add features to conferencing. One is to persuade the conference system operators to do it. This often works, but of course it's slow. A consensus of users has to emerge, system operators have to schedule the changes, software must be written and tested; and no matter how needed the changes, the system manager will understandably object to "creeping featurism" as more and more users ask for new capabilities. Moreover, no matter how many features are added, the system is unlikely to be optimum for each individual.

There's a better way.

Participants in early computer conferences generally accessed the conference with simple terminals. Now it's more usual to employ a microcomputer. In my own case I've been using the Kaypro 286i, which is a PC AT workalike. While I have made some use of the computer's capabilities, particularly the SideKick and Superkey utility programs, I haven't used them much. For all of its power, when I'm on-line the microcomputer isn't much more than a very smart terminal.

When I sign on to BIX, I'm confronted with something similar to the following:

YOU HAVE 37 MESSAGES IN YOUR IN-BASKET.

YOU ARE A MEMBER OF 11 CONVERSATIONS.

YOU ARE A MEMBER OF 24 CONFERENCES.

YOU HAVE 184 UNREAD MESSAGES.

My machine ought to be able to screen and organize all of this. But alas, the software doesn't exist.

I intend to change that.

I may have to write the preliminary version of my "CMC Assistance" software package, but I'm sure it won't be long before the market potential of such programs is discovered by the software industry.

There are already some programs intended to help users with on-line information services like Dow Jones, but they're not what I'm talking about. I'm interested in software specifically designed to make it simpler for me to handle computer conferences.

First, of course, this software will have to have most of the features of

**A GOOD
assistance program
will make it simple
to sort your mail
and conference
messages according
to your own
priorities.**

a standard communications program: storing phone numbers and call-up information, automatic dialing, upload and download, ability to capture stuff as it comes in and store it on disk, print it on paper, or both; all that kind of thing. There are plenty of such programs now, of course; a conferencing program will have to be at least as good as they are for general-purpose communication.

Next, there's no reason why my computer can't screen both mail and messages for me. By "mail" I mean private messages addressed to me alone, not broadcast in a conference to all participants. Mail is easily sorted, by subject matter, by source, and by priority. Clearly there are many ways to sort mail, and what's optimum for me won't be best for you; a good conference assistance program would start with some general procedures and allow you to change them as you learned more of what you wanted. Want to see mail about certain subjects first? Always? Or always except when there are messages from certain people who take priority? And so on.

The conferencing assistance software then should access a con-

ference message, scan the message header, see who the message is from, and depending on the sender, either present the message to me, construct a briefing from the message header and the first line, store it on disk for later access, or throw it away entirely. It also should make a record of discarded messages so that I can return to the original conference and get one back if I need it.

Since message headers are quite different for different conferencing systems, the message parser will be conference dependent. In these days of structured programming it shouldn't be hard to do that. You have to tell the system what file to bring in to get to the telephone number, baud rate, and other characteristics of a conference; it can also call in the other modules to tell the program what this conference's header looks like, how the editor works, and so forth.

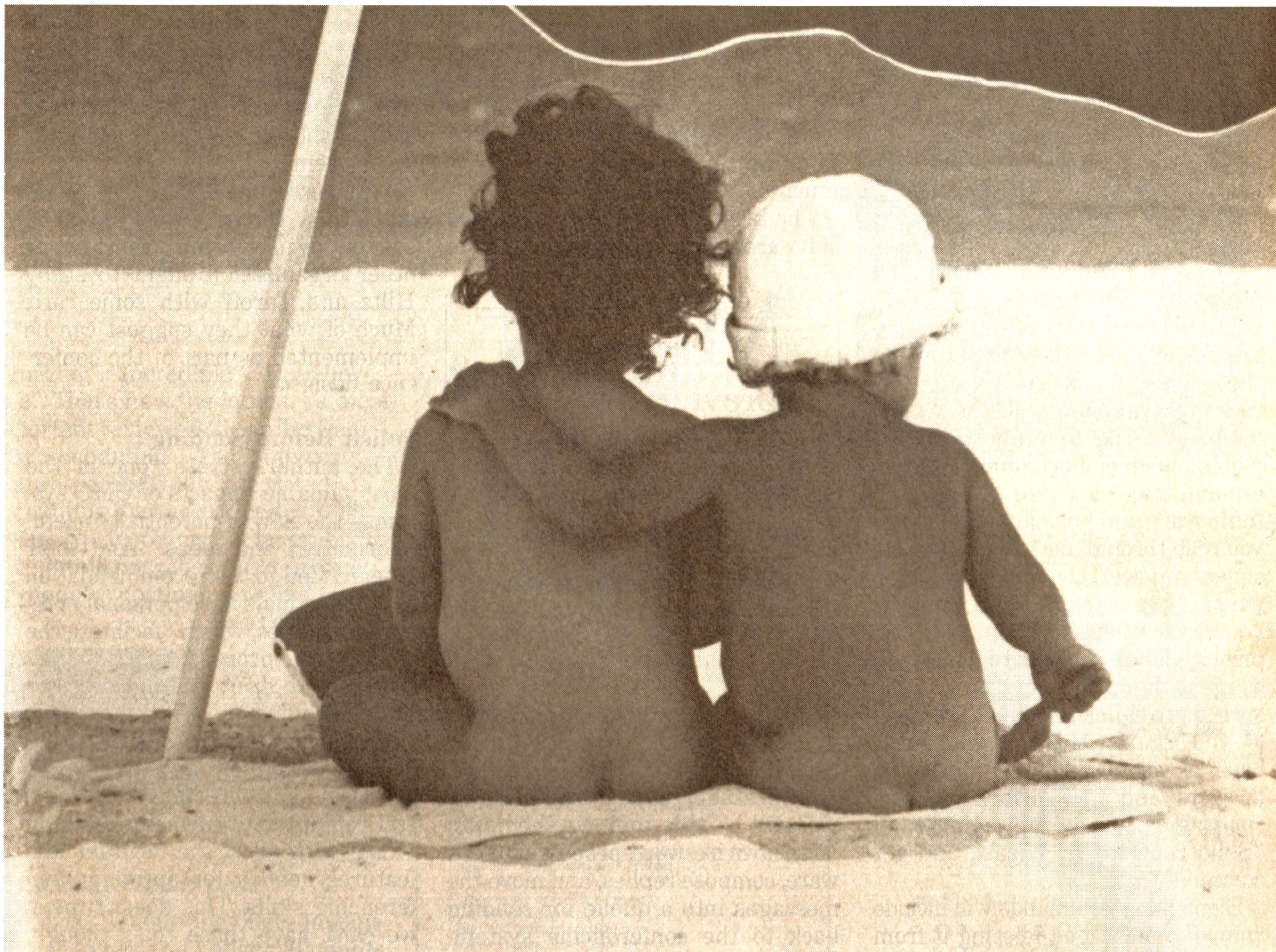
On BIX, messages come in two forms: some are original; others are responses to previous messages. The result is a series of "chains." While the conferencing software attempts to keep track of the various message threads, it often isn't very good at it, and the messages and comments come through in a jumbled and disorderly heap. There's no reason why a machine as powerful as the PC AT can't sort through the message headers and reorganize the incoming traffic, especially if those sending the messages will cooperate in using keywords in the message topic.

Micros to the Rescue

There are other ways the micro can help. As I read through the CMC material, I find some messages that deserve immediate comments. Others, though, need more attention or require me to look something up. Ideally I should be able to flag them for later attention. BIX conferencing software doesn't permit that; the messages are either read or unread. I can, of course, use a pencil and paper—or SideKick and Superkey—to make notes identifying the messages I ought to see again. That's not very convenient.

There is no reason, though, why I can't have a local micro program that

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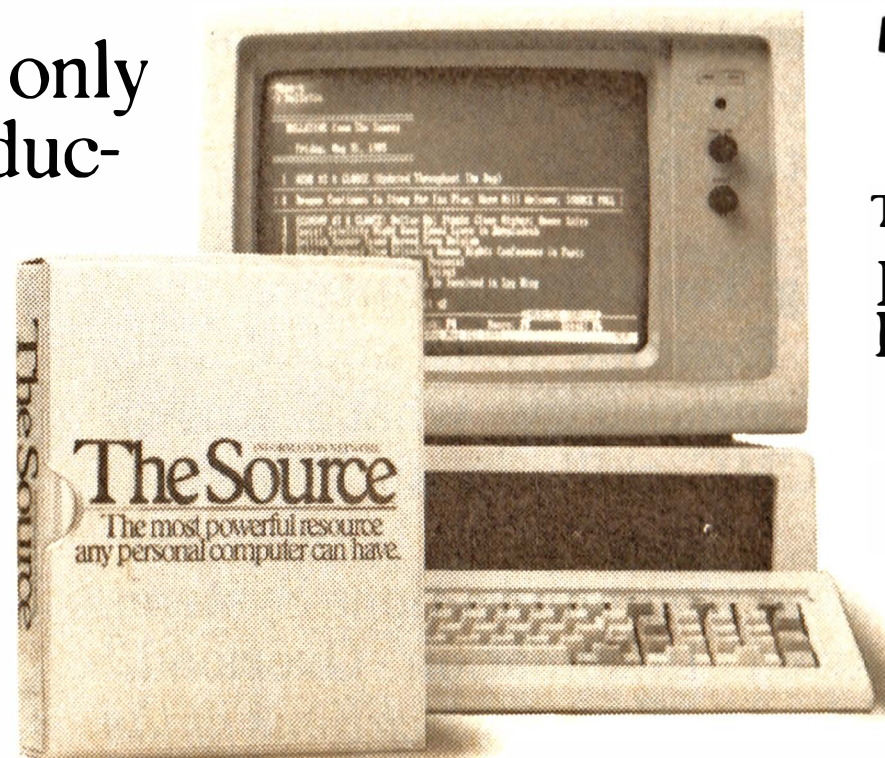
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works with conferencing software to accomplish the job. It could even sort the messages by topic and let me assign them priorities, like "Urgent" and "Today" and "Real Soon Now." With very few exceptions, there are no messages so urgent that they must be composed and sent this instant; they can easily wait an hour and more.

As a first cut then, information processing could be done off-line. All of the files that might be interesting are brought into the computer and the connection is closed. You can then go have coffee while the system trundles. The software would use a whole bunch of electronic file drawers and folders. These can be both temporary and permanent. Then as you read through both mail and messages, you send the materials off to where they belong, and as you do, you can be marking them with the priority labels. New categories will suggest themselves as you use the system; well-designed software will let you organize this "message database" as you go, adding both new file drawers and new priority labels, such as "Look at this again" and "Send copy to Dr. Wizard and get comment," etc.

Elementary commands will include "move" a message (deleting it from where it is), "copy" it, and the like. Some conferencing systems have commands like that, but if each individual could rearrange an on-line conference to suit his needs, chaos would result. Doing it on your home system disturbs no one and makes tracking and using the information flood much simpler.

Say What

One of the biggest problems with conferencing is your own comments. CMC systems make it very easy to send replies to messages as you see them; often the reply is composed and sent, and *then* you find that five other people have also replied, the original message that caused you to comment has been modified, and everyone else has now moved the discussion to another topic.

Another scenario. The topic is important. You don't have much time. Best to do a quick answer and get on to something else. Alas, the an-

swer turns out to be more complex than you thought, but you're already in the middle of composing it on-line. The conference's text editor is lousy, and there's no convenient way to rewrite. You can send the comment as is or cancel it entirely. Neither is much of a choice.

The best conferencing assistance software will offer some relief from

MICROS CAN
provide us with
all the facilities
and features needed
for custom-tailored
conferencing and a
way to screen
out the junk.

this dilemma. With all of your mail and messages sorted and marked, you will be able to move them into your favorite word-processing software, compose replies, and move the messages into a queue for sending back to the conferencing system. The conferencing assistance software will function much like a mail-merge program at this point, attaching the appropriate conferencing commands and sending all of your material as a batch file back to the conferencing system.

By composing responses off-line, you'll save money and lose only a bit of time. You can also access a spelling checker, call in indexed text files, access other databases, and in general have reference assistance. The result would be a great improvement not only in your reputation, but in the content of the conference itself.

Groping Toward the Future

Starr Roxanne Hiltz and Murray Turoff summarize what's known about CMC skills in an important paper, "Structuring Computer-Mediated Communications Systems To Avoid Information Overload," published in *Communications of the ACM* for July 1985.

The paper summarizes the results of research supported by National Science Foundation grants, and while parts of it can be tough to get through, there's a lot of solid information about organizing conferencing systems.

It's all excellent advice, and anyone starting a computer conferencing system for use within a company or other organization ought to study Hiltz and Turoff with some care. Much of what they suggest can be implemented as part of the conference design.

Polish Before Sending

The authors stress "one of the most valuable impacts of CMC systems—the flow of potentially useful information and ideas." And their research led to the recommendation that individuals have personal notebooks and files, which "facilitate the conference process by allowing members to draft and polish items before sending them to the group."

However, for very large conferences, such as BIX, it would be both expensive and difficult for the central computer to furnish each individual with all of the facilities and features needed for optimum conferencing skills. This doesn't mean we can't have those tools though; most can be implemented in the microcomputer used to access the system.

It's just as well. Hardware capabilities have leapfrogged ahead of knowledge; not only don't we have good conference assistance software, we don't even have a good theory as to what that software should be; there are only suggestions.

Like it or not, there's a computer conference in your future. And like "computer literacy," skill in using computer conferencing tools will one day be a prerequisite for all but the most menial jobs.

The good news is that microcomputers offer the flexibility to allow experimentation in this new and important branch of the information revolution. □

Jerry Pournelle welcomes comments from members of the micro revolution. Write to him c/o *Popular Computing*, POB 397, Hancock, NH 03449. Jerry tries to answer all his mail but cannot promise individual replies.

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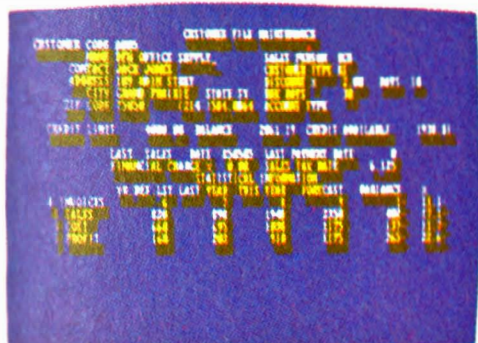
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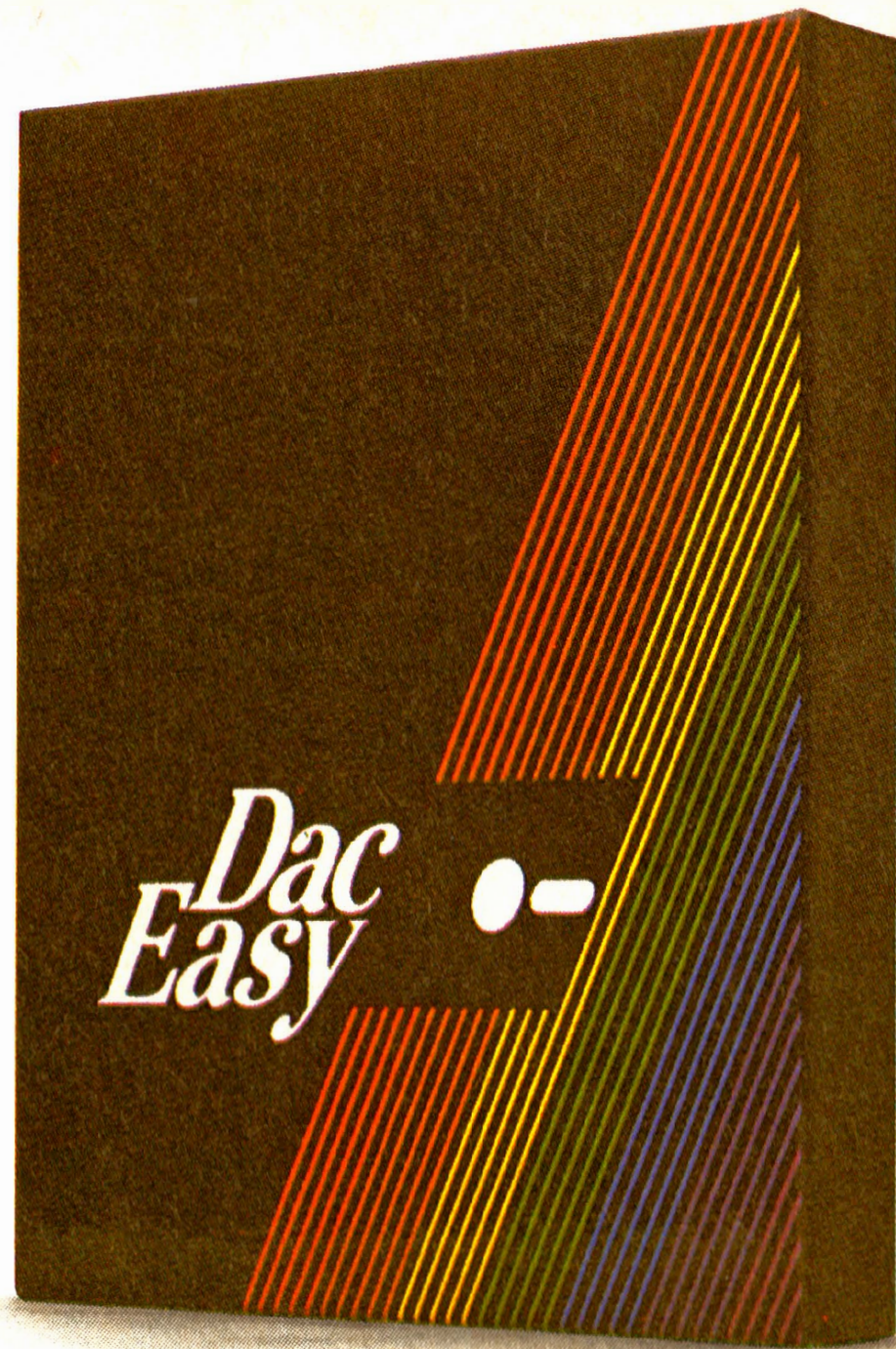
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Intelligent Databases

Database programs, perhaps the most stagnant of all major types of computer software, may be in for big changes.

New programming techniques rooted in artificial intelligence, such as natural-language interfaces, may help database designers finally merge ease of use with a surprising amount of power, yielding the most radical change in such programs in years.

Back in August, I talked about how free-form text databases and Macintosh concepts such as icons and bit-mapped graphic filing systems were changing our perceptions of database management. Nevertheless, the traditional uses of database programs—as managers of either a single list of information or multiple connected lists—still account for the most common applications.

In these traditional uses the programs have undergone little change over the past several years, particularly in the world of the IBM PC and compatible computers. At one end of the spectrum, you have simple file managers, perhaps best exemplified by Software Publishing Corp.'s PFS:File. Such programs are typically quite easy to use, but they're slow and inflexible.

At the other end, you have relational database programs that can handle multiple files, best exemplified by Ashton-Tate's dBASE series and Microrim's R:base series of programs. While such systems are powerful, they generally require programming—using what is known

AI concepts revolutionize the way we work with database programs



as a procedural language.

A large number of programs, such as Advanced DB Master and Powerbase, have tried to stake out a middle ground. But while some of these programs are well regarded, they have failed to gain a place on dealer shelves, the best-seller lists, or in the minds of most consumers. Two new programs may change that.

Paradox

For instance, Paradox from Ansa Software (Belmont, CA) attempts to combine the power of a fast and sophisticated relational database with a simple user interface and an easy way of retrieving and updating data. The user interface follows the menu scheme made popular by programs

such as Lotus's 1-2-3, so it is relatively simple for 1-2-3 users to pick up the new application. But it is Paradox's data-retrieval mechanisms that make it different.

The \$695 program fits the general description of a relational database in that it allows you to deal with multiple connected files simultaneously. But unlike most such programs, you do not have to create complex programs to retrieve information from these files.

Instead, Paradox uses a concept called query-by-example to retrieve records and create reports. When you first ask to view a file, the program displays it in a table format, although you can also look at records individually in a form that you design. To help you retrieve information, the program displays

a form indicating all the fields in the file. To get information from one file, you merely indicate the fields you want displayed, along with any qualifying information (such as only showing orders from California). And to get information from multiple files, you call up pertinent retrieval forms and then type in similar examples to indicate which fields match among the different databases. This lets you join multiple files together in a much simpler fashion than most other relational programs.

Once you've entered your example, then the program begins to use its artificial-intelligence concepts. A concept called program synthesis ef-

Michael J. Miller is *Popular Computing's* West Coast Bureau Chief.



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fectively creates an internal program to find the information requested; therefore, you don't have to write such a program, as you would in the older database programs. And a concept called heuristic query optimization seeks the quickest way to get the information and generally comes up with a much faster search than the older programs.

While other programs such as dBASE III and R:base 5000 now both include simpler, menu-driven ways to create programs in their application languages, those approaches are much more limited and not as flexible as the approach that Paradox is taking. However, for more complex tasks, Paradox includes a built-in programming language called Paradox Application Language, which is like the procedural languages that form the heart of the dBASE and R:base programs.

Q & A

Symantec (Cupertino, CA) is taking a quite different approach with its Q & A, essentially a list-management program that adds a natural-language-query system.

At first glance, Q & A looks a lot like PFS:File, including a similar menu structure and method of designing and displaying forms to hold record information. And like PFS:File, it works with only a single file at a time and is aimed at a less sophisticated audience than the full-scale relational databases.

If you want to, you can use the program in nearly exactly the same way you do PFS:File. You use a menu system to choose between designing a form, adding records, and searching records. The form design consists of laying out fields on a blank screen. You can retrieve, search, and sort information by filling in a form that matches the fields on your record form. The program can then display each record that matches your request, showing it one form at a time, just as the other program does, though it is considerably faster and is also able to display records in a table format.

In addition, Q&A contains a report section similar to PFS:Report and a low-end word-processing section that is similar to PFS:Write but that also

supports WordStar control-key sequences. You can use the word-processing features in conjunction with the file-management features for mailing lists and form letters.

But what makes the \$295 program different is its natural-language-query method. In addition to the query-by-example method of filling in the retrieval form, the product also lets you look through your file via its "Intelligent Assistant."

This lets you retrieve information from your database in an even simpler manner, by typing in English-like statements. For instance, you could ask it to "show all the apartments with rent less than \$1000." In addition, it contains more sophisticated natural-language features, including support for logical operations, such as statements with "and" and "or," as well as mathematical operations such as average. As a result, you could ask it to "show all apartments with pools or rent less than average."

Other programs such as Micro-*rim's* Clout option for its R:base series also offer natural-language queries (see "Natural Language Interfaces," June 1985 page 52). But Q & A's natural-language system includes the ability to add new records or modify existing records, which Clout does not offer. And the Intelligent Assistant section is much more advanced in its ability to understand English-like statements and to perform complicated searches.

Q & A is a one-file list manager and thus not nearly as sophisticated as Paradox or other relational databases. Still, it is much easier to use, and many applications (such as a single mailing list) require only a list manager, not a more complicated program. And list managers can still be quite powerful in determining the current state of a business.

Similarities and Differences

Obviously, both programs are databases with input from research into artificial intelligence topics. But there are other similarities beyond that.

Like most of the industry's great programs, both Paradox and Q & A were originally the inspiration of one or two people. Ansa was founded

by Richard Schwartz and Robert Shostak, who both were senior computer scientists at the Computer Science Laboratory at SRI International. And Gary Hendrix, who founded Symantec, was manager of the natural-language program at SRI's artificial intelligence lab.

Beyond that, both firms have venture-capital funding, fairly unusual in today's crowded software market, as well as a large number of employees who were involved in other major software launches.

Still, Paradox and Q & A are very different programs. Q & A handles only one file at a time, while one of Paradox's strengths is the easy way it lets you look at information combined from several different files. The primary way to search for information in Q & A is its unusual natural-language-query system, while Paradox uses a simpler query-by-example method.

Another difference may be the audience. Though Ansa is describing and positioning Paradox as a sophisticated database that can be used by everybody, its complexity and higher price indicate that, at least initially, it will appeal more to users familiar with database programs and to the corporate market, which Ansa believes wants a single program that can be used by employees at all skill levels.

In contrast, while Symantec certainly hopes Q & A will be accepted by the corporate market, it doesn't see it as a replacement for dBASE. Instead, it may prove to be a natural upgrade for PFS:File users and a good entry-level product for people who haven't previously used any type of database program.

As you've probably guessed by now, my general reaction to both Paradox and Q & A is quite favorable. I've looked at early versions of these products, so we'll have to wait for final versions to determine how well the companies finished executing their concepts. Although they take different approaches, there's probably room in the database market for more than one new success. One thing is apparent—the traditional answers to database problems no longer appear to be enough. □

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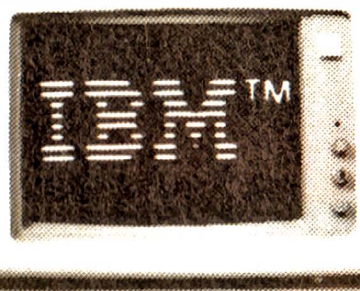
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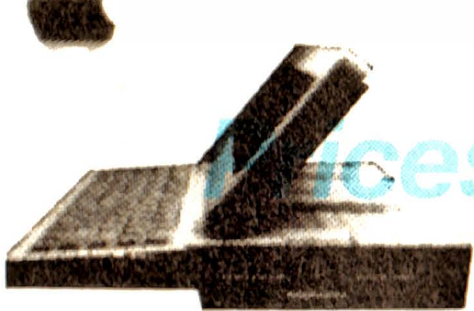
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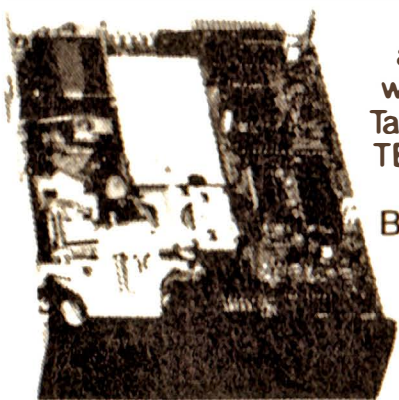
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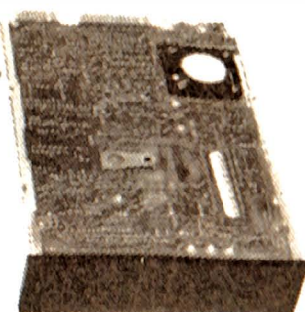
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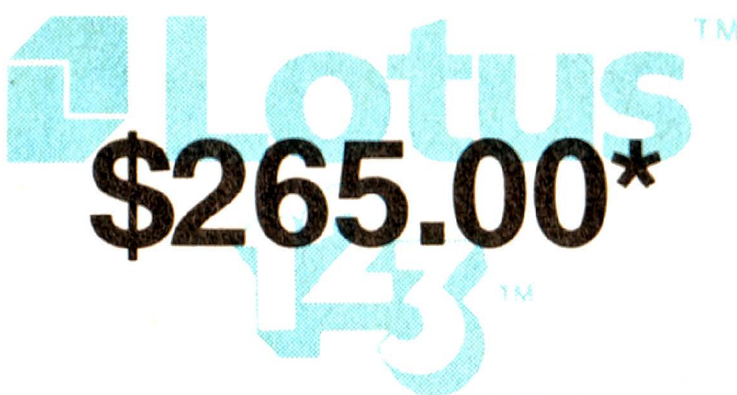
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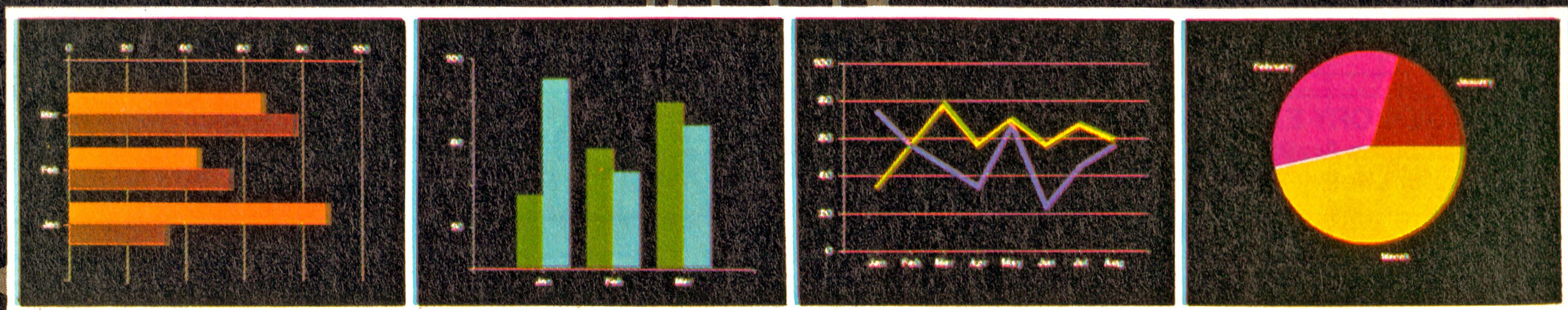
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SPECIAL REPORT

UP GRADING



YOUR BUSINESS GRAPHICS

BY KEN D. SCHMEUPE

If your graphic presentations are being outclassed, it's time to enhance your system

THE USE OF COMPUTER-GENERATED GRAPHICS IN business is advancing more rapidly than perhaps any other personal computer application. Whether they're for internal analysis, presentations, sales pitches, or publication, today's business graphics are notably sharper, fancier, and more effective than they were just one year ago. If you're beginning to feel that your business graphics don't measure up, it's time to upgrade.

Business graphics software falls into two classes. Less sophisticated graphics programs—often part of a spreadsheet package—create bar charts, pie charts, or line graphs primarily for internal analysis among peers. Presentation-graphics software, on the other hand, is more versatile and creates superior output in the form of plots or slides. In this article, we'll focus on some noteworthy presentation-graphics packages that work with MS-DOS-based personal computers.

But before getting into specific programs, let's put presentation-quality graphics into perspective, look at hardware concerns, and outline the ground rules we used to select the seven software packages we discuss in detail.

Who's the Audience?

Unlike analytical (sometimes called "peer") graphics packages, which are unpretentious and used at weekly and monthly in-house meetings to convey information quickly, presentation-graphics software is designed for high-level meetings within a company or with customers. The objective is to sell something or convince someone about a product or service. Although business people making such presentations occasionally rely on overhead projection of transparencies, more often they go for the better quality offered by 35mm slides. Preparation of presentation-graphics materials requires special hardware that, until recently, was too costly for all but service bureaus that specialize in producing elegant slides from your input data and instructions.

Presentation graphics also covers illustrations for reports, manuscripts, or other printed material. Black-and-white or color plots are typically used for this purpose. Slides are often acceptable for reproduction at less than presentation quality because the enlargement factor is smaller on a printed page

than on a projection screen. And for those applications that require excellent plots and transparencies but not presentation-quality slides on an everyday basis, medium-resolution hardware will do the job.

As you may already have inferred, it's impossible to discuss presentation-graphics software without also considering hardware. To achieve the best results, more than a "plain vanilla" personal computer is in order. If you're creating a system from the ground up, the examples that follow will give you an idea of what to purchase. If you already have a system, it should be easy to upgrade it to do the job. The specific hardware mentioned here reflects the system I used in evaluating graphics software for this report and is an example only—similar products from other manufacturers will do the job just as well.

Necessary Hardware

For high-volume production of presentation-quality business graphics, you'll need an MS-DOS-based computer with a 10-megabyte hard disk (software that runs on dual floppy disks will be noted) and a color display with a resolution of about 640 by 400 pixels. For plots and transparencies, a pen plotter capable of 0.001-inch resolution is essential. Presentation-quality slides require a film-recording camera which converts electronic computer output directly to 35mm slides (not a "screen-shot" camera) at a resolution of about 2000 points per inch or higher; a special driver card may be needed for the camera. The hardware outlined in the box on page 52 represents a state-of-the-art micro-computer-based presentation-graphics system.

Of course, you can get by with less equipment, but there are trade-offs. A floppy-disk-based computer costs less, but you'll lose time swapping disks and accessing programs; a low-resolution monitor with monochrome or four-color display also costs less, but you'll have only a vague idea of what the hard copy will look like.

Nevertheless, you can adapt the sample system to your budget and needs—if you're primarily producing plotted graphics for publication rather than slides for presentation, forget the digital film-recording camera and concentrate on getting

	CHART-MASTER	ENERGRAPHICS	GRAFTALK	GRAPHWRITER	CHART 2.0	MIRAGE/AUTUMN/VR	PC-SLIDE
Cost (\$)	375	450	450	395-595	295	395-695	995-4000
Version	6.1	1.3	4.0	4.3	2.0	4.0	2.1
Memory req. (K bytes)	192-320	128	256	192-320	256	384-640	256-512
Hard disk	Opt	Opt	Opt	Opt	Rec	Rec	Rec
Drawing (2-D, 3-D)	N	3-D	2-D	2-D	N	2-D	2-D
Slide show	N	Y	Y	N	N	N	N
Statistics	Y	Y	N	Y	Y	N	N
Batch processing *	N	N	N	Y	Y	Y	N
Ease of use **	2	3	2	2	2	3	3
Cameras supported:							
Matrix PCR	N	Y	Y	Y	Y	Y	Y
CalComp Samurai	N	N	Y	N	N	Y	N
HP 7510	Y	Y	Y	Y	Y	Y	Y

Legend: Rec = recommended, Opt = optional, N = not available, Y = yes. * Batch processing refers to the software. The Matrix PCR film-recording camera system provides batch processing in all cases. ** Ease-of-use scale: 1 = easiest, 5 = hardest.

the best plotter for your purposes. Similarly, if razor-sharp slides are not necessary, you can easily get by with a less expensive, medium-resolution camera such as the Polaroid Palette.

Narrowing the Choices

Now let's turn to the heart of any presentation-graphics system: the software itself. To help you make sense out of the bewildering array of choices, we applied some strict criteria to the selection of recommended packages. Each program reviewed here:

- Accesses data files of Lotus's 1-2-3, today's most widely used spreadsheet program. Some of the software listed here can also be used with VisiCalc, SuperCalc, Multiplan, and similar spreadsheet programs.
- Supports medium-resolution (approximately 640 by 400 pixels) display in color. For anything beyond an

entry-level system, the ease of visualization this resolution provides is a cost-effective feature. Upgrading lower-resolution hardware to medium resolution via a suitable graphics adapter card and monitor will cost about \$1200.

- Drives pen plotters at 0.001-inch resolution. Unless your plotter can deliver this sharp an image, you'll see jaggies on the projection screen (with transparencies) or in the final plots. Examples of suitable plotters are Hewlett-Packard's 7470 or 7475 and the Houston Instrument DMP series. Plotter costs range from about \$1500 to over \$6000.

- Works with one or more digital film-recording camera systems. The Matrix film-recording camera (\$13,990 with QVP driver) delivers a resolution of 2048 by 1366 points on the slide. Comparable equipment includes the CalComp Samurai (\$11,950, but it accommodates less

software), the Lasergraphics-Polaroid film recorder (\$6999), and Hewlett-Packard's 7510 color film recorder (\$13,910). The last two camera systems use Hewlett-Packard's graphics language (HP-GL) and RS-232 serial input. Essentially, these cameras work with any software that generates (or can be translated into) HP-GL.

- Also works with medium-resolution film-recording cameras such as the Polaroid Palette, NISE Rembrandt, Focus Graphics Videoslides, Dunn MicroColor, and equivalents. Slides made from such equipment are typically at the same resolution as the display, but the Videoslides can generate about 1000 lines on the slide from a much lower display resolution. Costs for medium-resolution cameras range from about \$1800 (Polaroid Palette) to \$3500 (Dunn MicroColor).

- Provides professional documenta-

A COMPLETE PRESENTATION-QUALITY BUSINESS GRAPHICS SYSTEM

AT&T 6300 COMPUTER (HARD-DISK) WITH 640 BY 400 COLOR MONITOR	\$ 4985
TECMAR CAPTAIN EXPANSION CARD (384K-BYTE)	795
MATRIX QVP DRIVER CARD FOR FILM-RECORDING CAMERA	2195
MATRIX PCR FILM-RECORDING CAMERA	11,795
HEWLETT-PACKARD 7475 SIX-PEN PLOTTER (A/B SIZE)	1995
MISCELLANEOUS CABLES AND CONNECTORS	100
POINTING DEVICE (MOUSE)	150
GRAPHICS SOFTWARE (TYPICAL PRICE)	500
TOTAL	\$ 22,515

tion. Manuals are complete and cover procedures needed for setup, installation, and operation of the program. In most cases a tutorial is included and, typically, a reference section provides easy access to commands by name.

■ Runs on the IBM PC XT and true compatibles such as the AT&T 6300. If you have any questions about compatibility, be certain to check with both the hardware and software manufacturers before you buy.

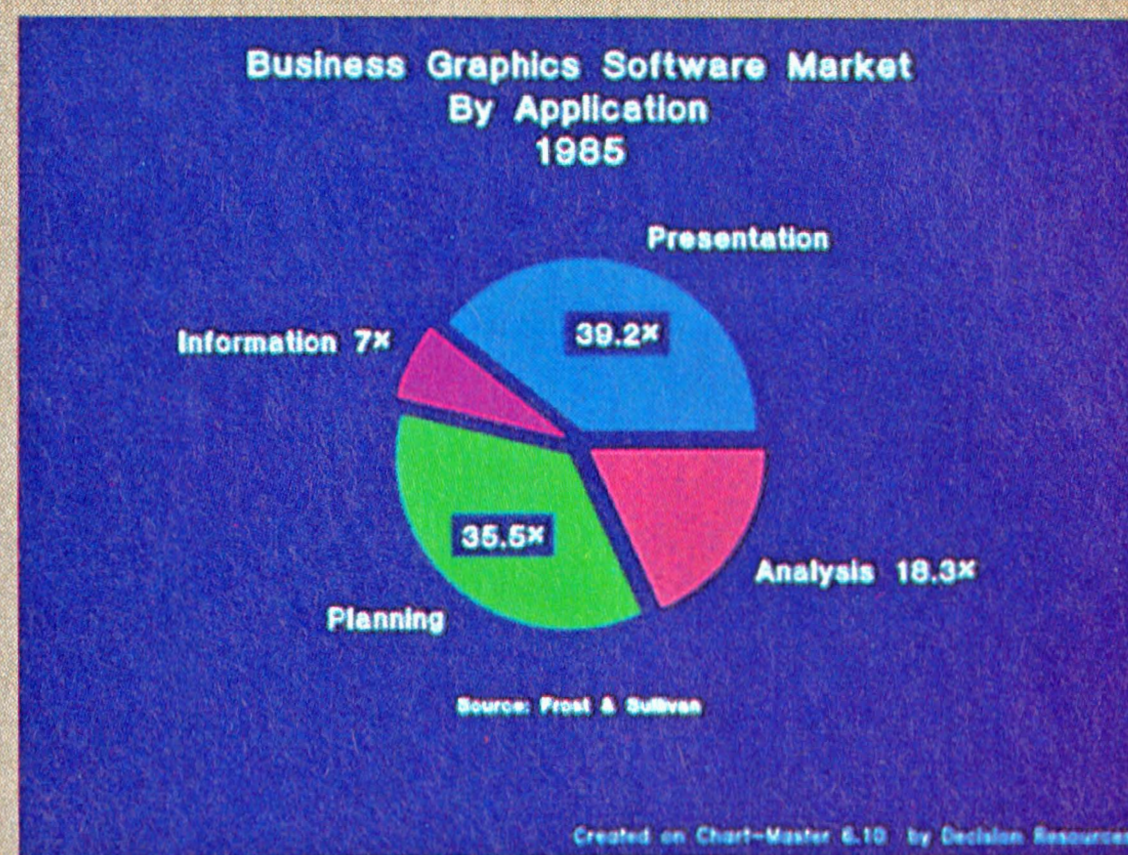
The chart on page 52 introduces you to the seven graphics software packages reviewed in this article. It notes the major differences among the programs to give you an idea of the general range of the software and is intended as a guide to presentation-graphics software rather than as a head-to-head comparison of various packages. The outstanding features and the drawbacks of each program are described below.

Of course, the final "what to buy" decision is your own, for selection of software must be based on your particular needs. Typically, the best approach is to determine the requirements of your applications, select the software that best does the job, and then purchase hardware, allowing for upgrades and expansion.

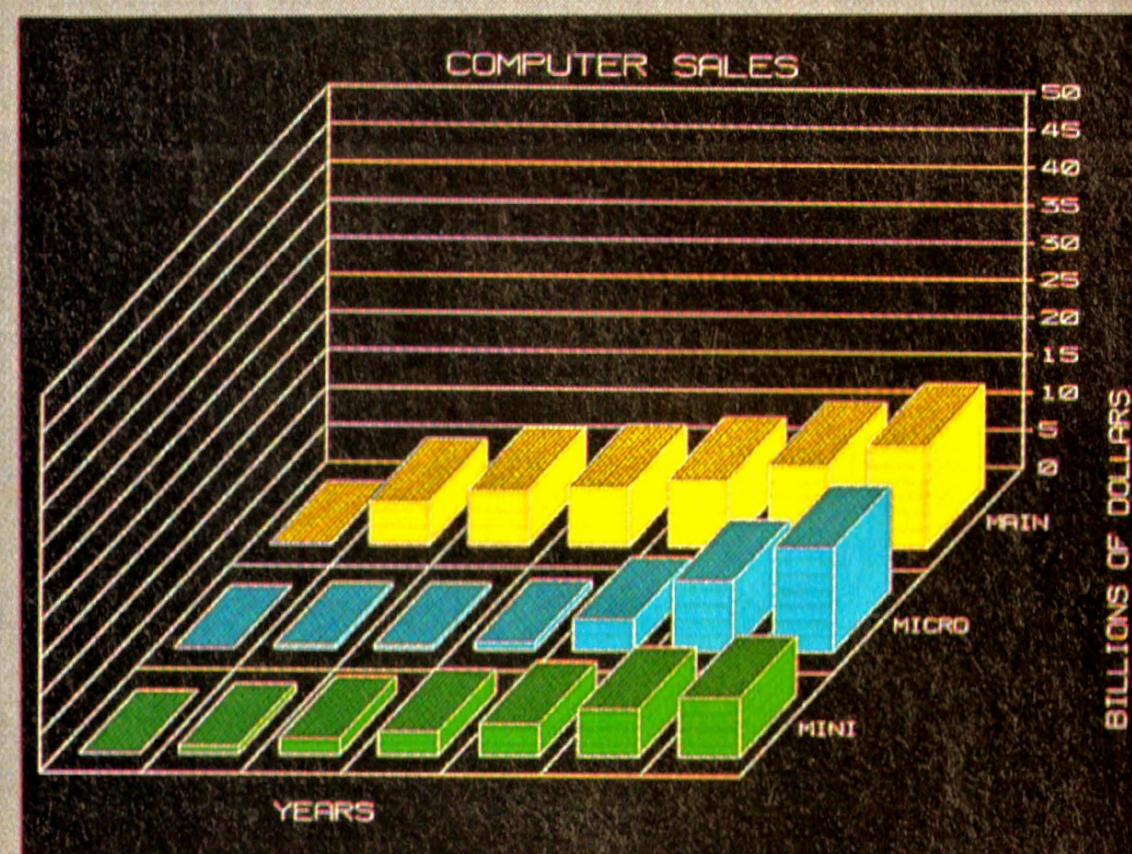
CHART-MASTER FROM Decision Resources is a tried-and-true graphics package that's currently used by such large corporations as General Electric, General Foods, and Alcoa. Its strongest feature is its ease of use and excellent documentation. The second chapter of the manual contains a brief tutorial that details the procedures for making a clustered-bar chart from scratch. Ten minutes after you start using the program, you'll have the finished graph on the screen. In addition to the tutorial, there are Help screens available at every step of the program.

Chart-Master is one of a series of software modules. Other modules include Sign-Master (\$245; for text pages, outlines, tables, and word charts) and Diagram-Master (\$345; for organizational charts, Gantt charts, and flowcharts). Diagram-Master, which has two-dimensional drawing-board features, is a recommended adjunct to Chart-Master—otherwise, your capacity to work in formats other than bar and pie

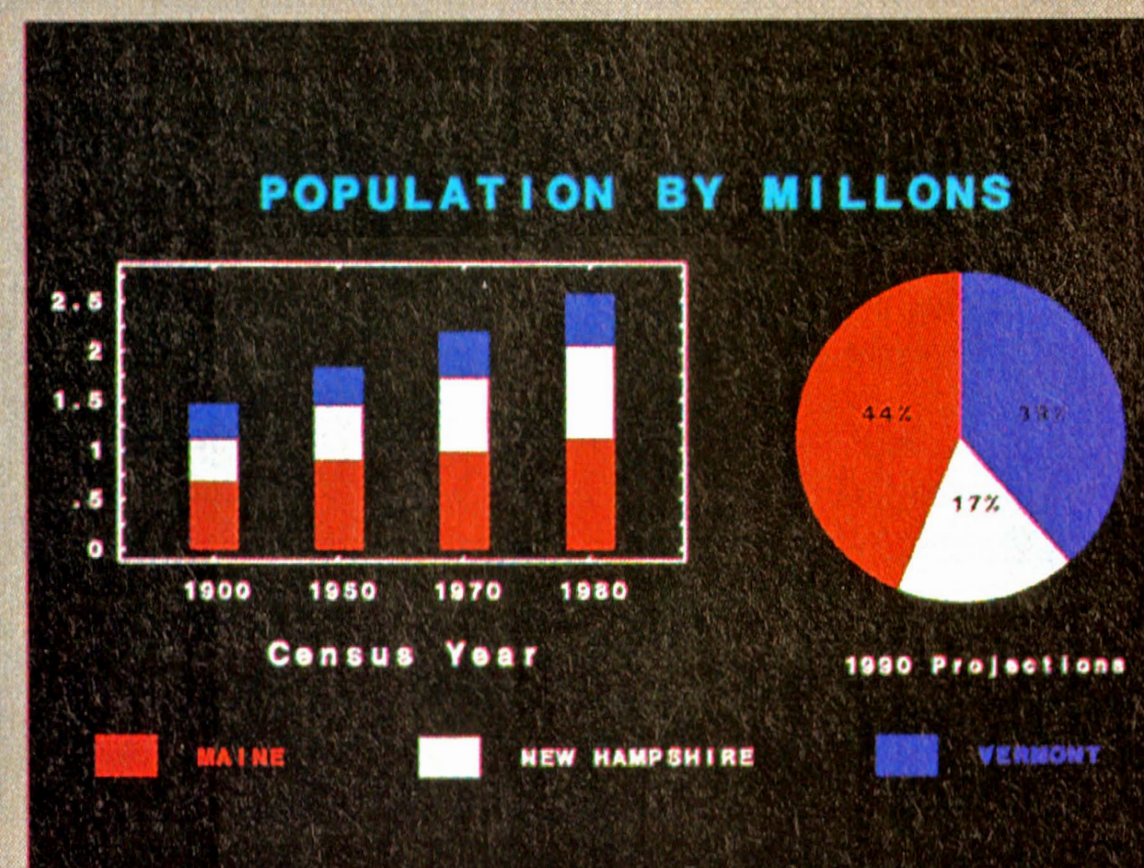
Chart-Master, from Decision Resources Inc., 25 Sylvan Rd. South, Westport, CT 06880; (203) 222-1974; price: \$375 (updates \$75); runs on MS-DOS and PC-DOS microcomputers with at least 192K bytes RAM (320K bytes or more recommended); requires two floppy-disk drives or one floppy drive and a hard disk; supports IBM, IBM Enhanced, IBM Professional, and Hercules graphics adapters; most printers; plotters including Amplot II, Apple, CalComp 84, Epson HI-80, Envision Vectorprinter, Gould, Hewlett-Packard 7200 series, 7470, 7475, 7550, Hitachi 671, Houston Instrument DMP series, IBM 7371, 7372, XY series, C.Itoh CX-4800, Mannesmann Tally PIXY3, NEC Bytewriter, Panasonic VP series, Roland, Strobe, Sweet-P, and Yokagawa; supports Polaroid Palette and HP 7510 film-recording cameras.



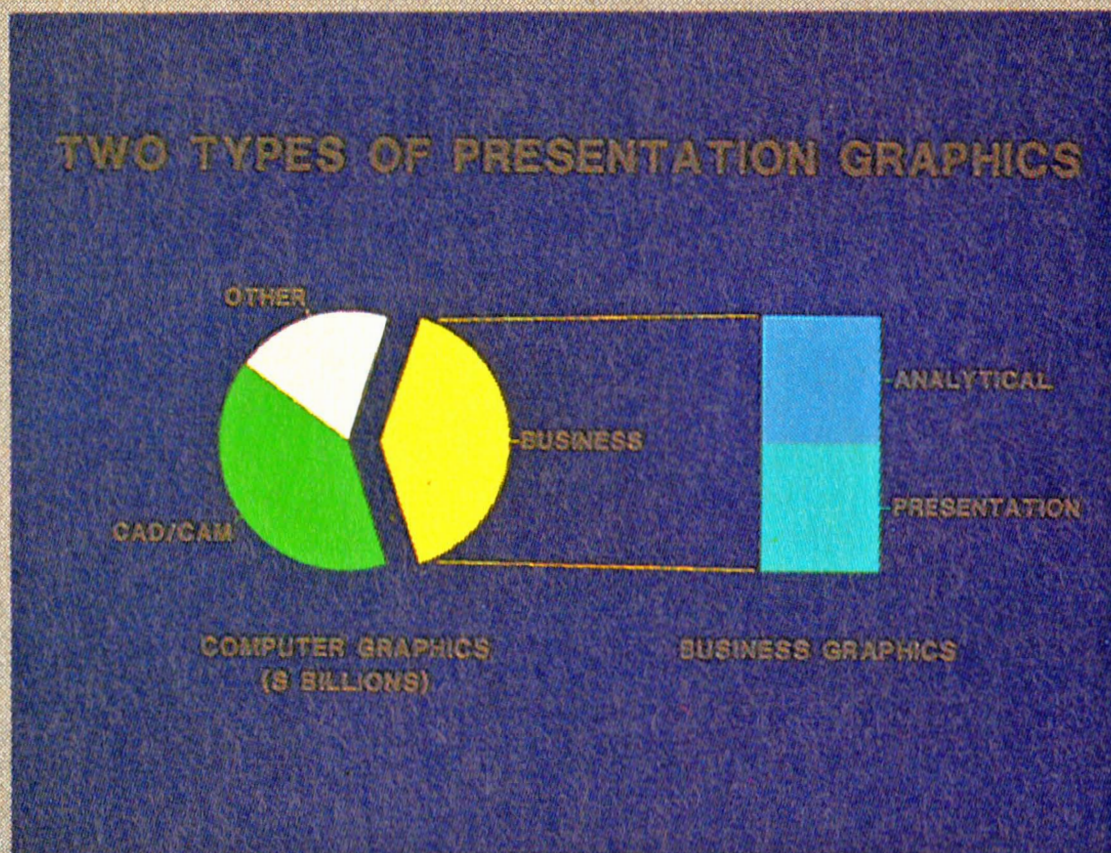
EnerGraphics, from Enertronics Research Inc., Suite 207, 150 North Meramec, St. Louis, MO 63105; (314) 725-5566; price: \$450 (\$350 without plotter driver); runs on MS-DOS or PC-DOS microcomputers including TI Professional and Wang PC; requires 128K bytes RAM and either dual floppy-disk drives or one floppy drive and a hard disk; supports IBM, Tecmar, Paradise, Plantronics, Quadram, and Hercules (color) graphics adapters; most printers; plotters including HP 7470, 7575, 7550, Calcomp 84, Houston Instrument DMP series, Amdek, Strobe 100, 260, Sweet-P, Mannesmann Tally PIXY3, Roland DXY 880, 980, IBM 749, 750, 7371, 7372, and Gould 6120, 6310; supports Polaroid Palette film-recording camera.



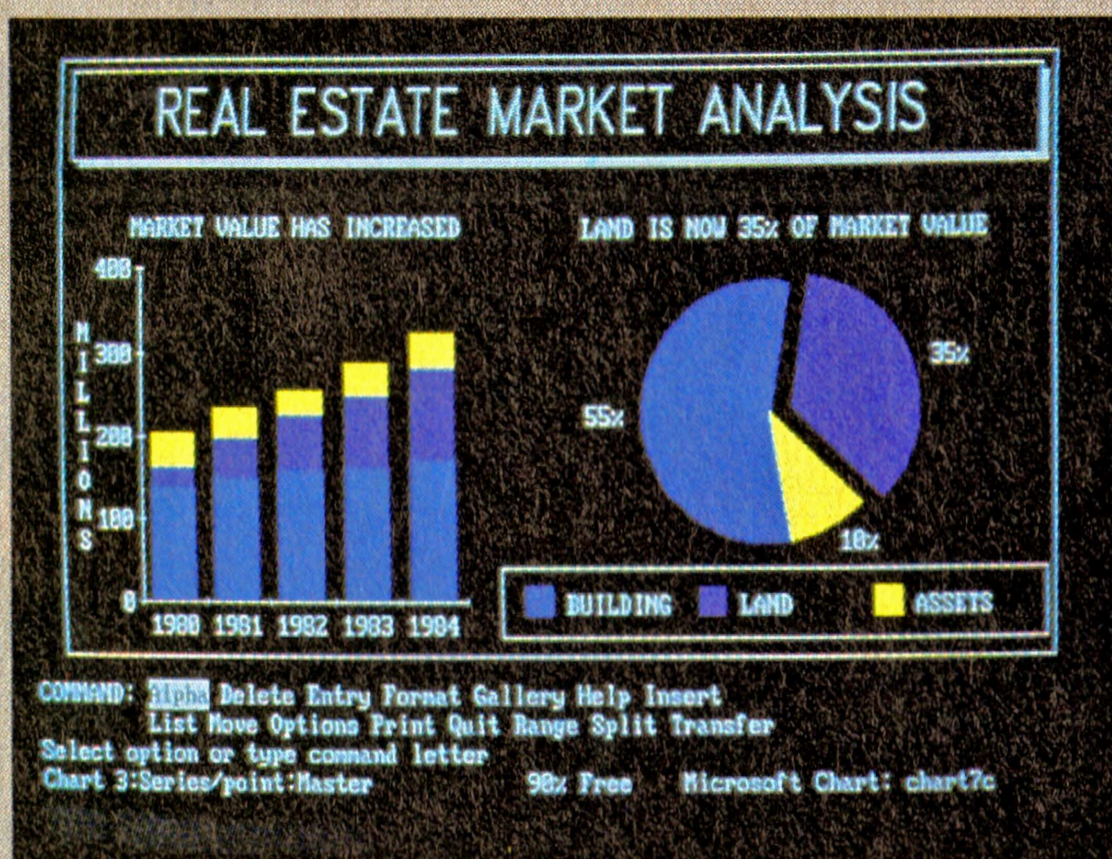
GrafTalk, from Redding Group Inc., 109 Danbury Rd., Ridgefield, CT 06877; (800) 435-7744; price: \$450 (upgrades from \$50 to \$100); 8-bit version runs on single-drive CPM level 2 and MP/M systems with 48K bytes RAM; 16-bit version runs on IBM PC XT, AT, 3270, and true compatibles with 256K bytes RAM; supports Hercules (monochrome) Paradise, Plantronics, STB, and Tecmar graphics adapters; most printers; plotters including Amdek, Amplot 2, CalComp 81 and 84, Goerz, HP 7470, 7475, 7550, Houston Instrument, IBM XY 749 and 750, Mannesmann Tally PIXY3, Panasonic; supports Matrix, Polaroid Palette, Dunn, and Videoslides digital film recording cameras.



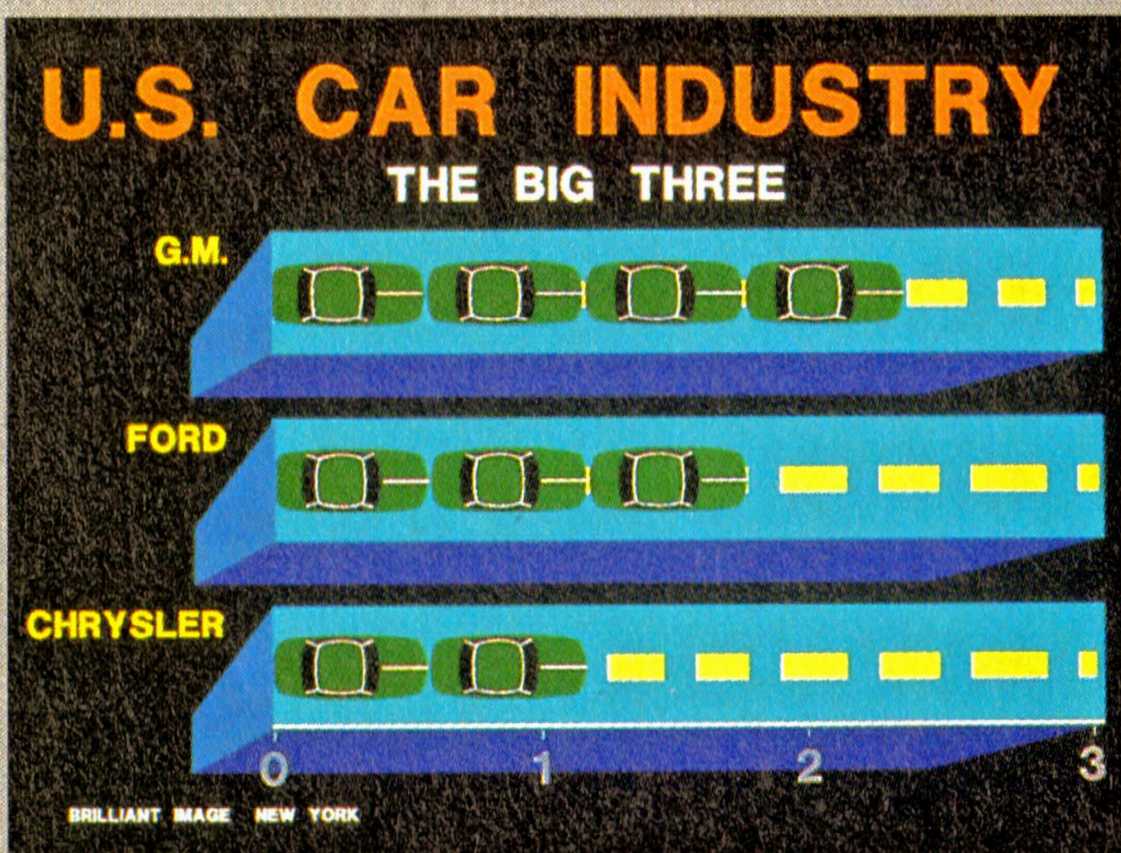
Graphwriter, from Graphic Communications Inc., 200 Fifth Ave., Waltham, MA 02254; (617) 890-8778; prices: Basic set, \$395; Extension set, \$395; Combo set, \$595; runs on IBM PC XT or AT and compatibles as well as Burroughs ET2000, DEC Rainbow, Hewlett-Packard HP-150, Wang Office Assistant, Tandy 2000, and Fortune Systems 3216; requires 192K bytes RAM and two 320K-byte disk drives or a hard disk; supports IBM and Hercules graphics adapters; most printers; plotters including HP 7470, 7475, 7550, 7220, IBM XY 749 and 750, CalComp 84, Mannesmann Tally PIXY3, and Houston Instrument DMP29; supports Polaroid Palette and Matrix PCR and QCR digital film-recording cameras.



Microsoft Chart 2.0, from Microsoft Corp., 10700 Northup Way, Box 97200, Bellevue, WA 98009; (206) 828-8080; price: \$295; runs on IBM PC and compatibles with DOS 2.0 or higher; requires 256K bytes RAM and at least one double-sided disk drive (two floppy drives or one floppy and a hard disk recommended); supports IBM, IBM Enhanced, and Hercules graphics adapters; most printers and laser printers; plotters including Sweet-P, HP 7470, 7475, 7550, Houston Instrument DMP series and PC series, Strobe M-260, Amdek, CalComp 84, Apple, and IBM XY 749 and 750; supports Polaroid Palette, HP 7510, Lasergraphic MP-2000, and Matrix PCR digital film-recording cameras, Videoshow presentation-graphics hardware, and Apple LaserWriter.



Mirage/Autumn/VR, from Zenographics, Suite 250, 19752 MacArthur Blvd., Irvine, CA 92715; (714) 851-6352; prices: Mirage, \$695; Autumn, \$495; VR, \$395; runs on MS-DOS or PC-DOS microcomputers and selected minicomputers and mainframes under various operating systems; requires at least 384K bytes RAM (640K bytes recommended); supports Hercules, IBM, Number 9, Plantronics, Scion, and Tecmar graphics adapters; most printers; plotters including CalComp, Hewlett-Packard, Houston Instrument, and Nicolet-Zeta; digitizers including CalComp, GTCO, Hitachi, Houston Instrument, Kurta, and Summagraphics; support Matrix PCR, Polaroid Palette, Samurai, Dunn, Videoslides, and HP 7510 digital film-recording cameras.



charts or line graphs is limited.

Chart-Master includes a "data grabber" feature that allows easy access to spreadsheets like Symphony or Lotus's 1-2-3. The package also comes with a symbol font and Helvetica-like text fonts. Chart-Master supports over 80 peripheral output devices and provides more than 40 customizing options, including hatch and line patterns, exploded pies, text fonts, axis control, floating legends, and others. The quality of hard copy, of both printed and plotted charts, is excellent.

ENERGRAPHICS IS A business-graphics package with a notable bonus: the program includes both two- and three-dimensional drawing capabilities. While its striking 3-D bar charts (with up to four Y scales) justify this feature alone, you can also design, plot, and create high-resolution slides of 3-D objects and surfaces. EnerGraphics excels at line graphs as well, offering curve fitting, log scaling, and regressions (linear or polynomial from 2nd to 10th order).

EnerGraphics is menu-driven and allows great flexibility in editing and preparation of custom charts. A data conversion facility directly reads many popular spreadsheet files (DIF or ASCII). A well-implemented Symbol Template feature lets you create custom symbols and store them in libraries (or simply use symbols from the library that's included). Sixty templates with up to 38 symbols per template are possible, ranging from architectural details and electronics parts through data-processing flowchart symbols and logic elements. This arrangement expedites design work because you don't have to redraw an element every time you want to use it.

EnerGraphics can present 3-D objects as wire-frame constructs (surfaces are plotted by mathematical functions or from data entry) and also allows rotation, zoom, and hidden-line removal. Perspective and scaling can be altered on an axis-by-axis basis. While these applications are clearly most useful in a design or drafting environment, they can also yield uniquely tailored graphics for business presentations. EnerGraphics is essentially a complete graphing/drawing system in one package.

GRAFTALK IS DESIGNED for people without a lot of computer experience—its strongest features are ease of use, simple installation, and versatility. GrafTalk lets you plot in vertical or horizontal formats, place text anywhere, and use multiple labels on the Y axis.

GrafTalk uses menus for all operations, further enhancing its ease of use. The program includes SCATE, a text-editing module that lets you edit labels and do simple word processing without loading a separate program. GrafTalk has found wide acceptance in the U.S. Army, Navy, Air Force, and Marine Corps—solid evidence of its versatility and user friendliness. As a straightforward business-graphics tool without a lot of frills, GrafTalk is hard to beat.

GRAPHWRITER SHOWS ITS greatest strength in its efficient modular design—it is a series of single-task programs. Each covers a particular charting format, making it fast and convenient to access a particular program and change the default values to produce the chart you want. Graphwriter also offers a unique “input form” that can be used as a guide in the preparation of charts and graphs. This means that you don’t have to train everyone in your office who needs charts or graphs to use the program—anyone can start using the system merely by filling in the blanks on the form.

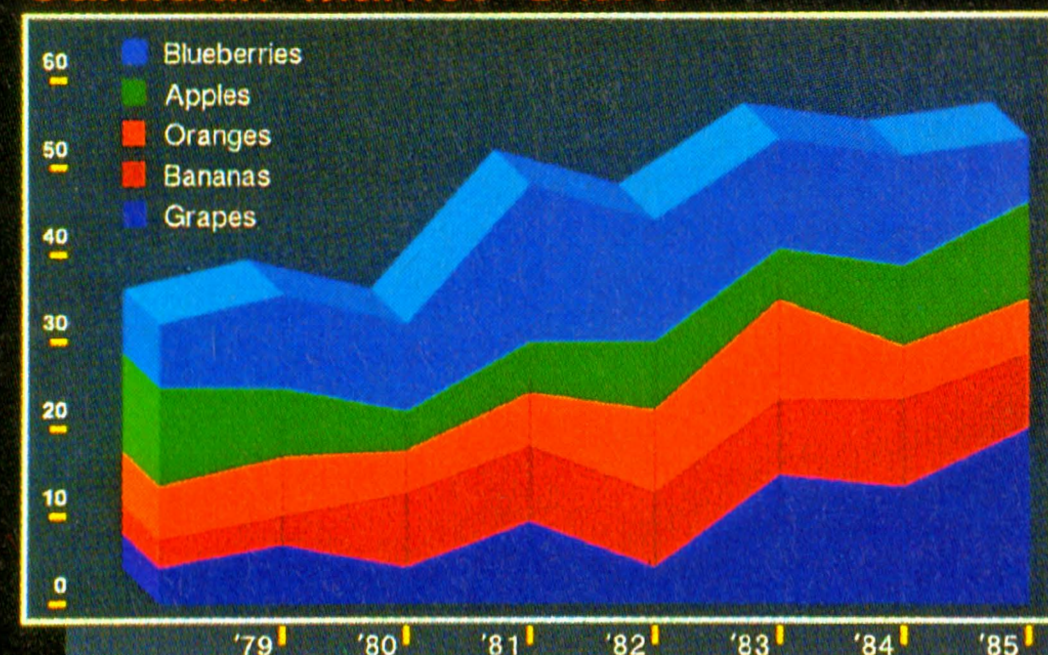
The program is somewhat large from the system’s perspective. Installing all of Graphwriter on a hard disk requires over 2 megabytes of space. Using the entire program on a computer with dual floppy-disk drives is possible, but the need for extensive disk swapping makes it impractical. If your application requires use of only one or two charting modules, however, this limitation is less important.

Graphwriter automatically controls design features such as pen speed and character positioning, preventing skipped lines on plots and ensuring an uncluttered graph. The program will store images in a batch file for processing at a later time. A menu is used for selection, and only a few parameters need be changed for routine work. Throughput for everyday graphing and charting is, therefore, extremely rapid.

PC-Slide, from Management Graphics Inc., 2064 Avenue Rd., Toronto, Ont. M5M 4A6, Canada; (416) 485-2855; prices: PC-Slide/50 basic design package for HP-GL output, supports Videoshow presentation-graphics hardware, \$995; PC-Slide/100 adds drivers for Diablo C150 inkjet printer and Matrix PCR and QCR and HP 7510 film recorders, \$1995; PC-Slide/200 adds auto-answer modem capability and

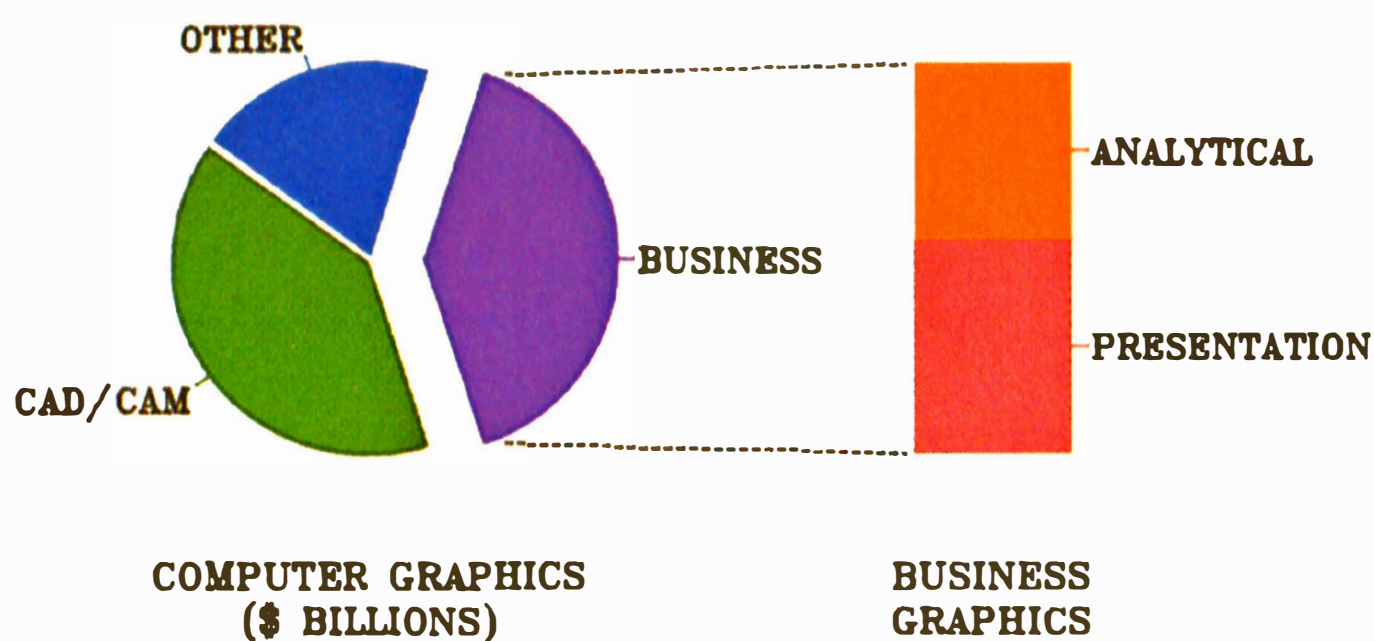
management and accounting software, \$4000; runs on IBM PC XT or compatibles with 256K bytes RAM (100 and 200 packages require 512K bytes RAM plus a 10-megabyte hard disk); supports Hewlett-Packard or compatible plotters and cameras, Diablo C-150 inkjet printer, Seiko D-Scan laser printer, and Matrix PCR and QCR film-recording cameras.

Canadian Market Share

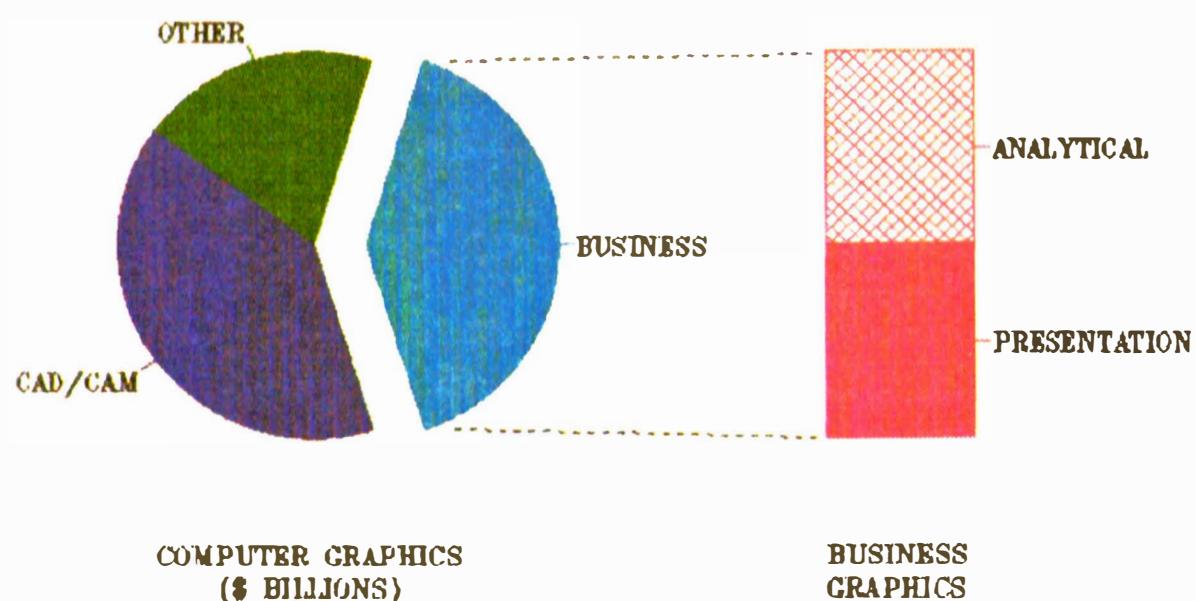


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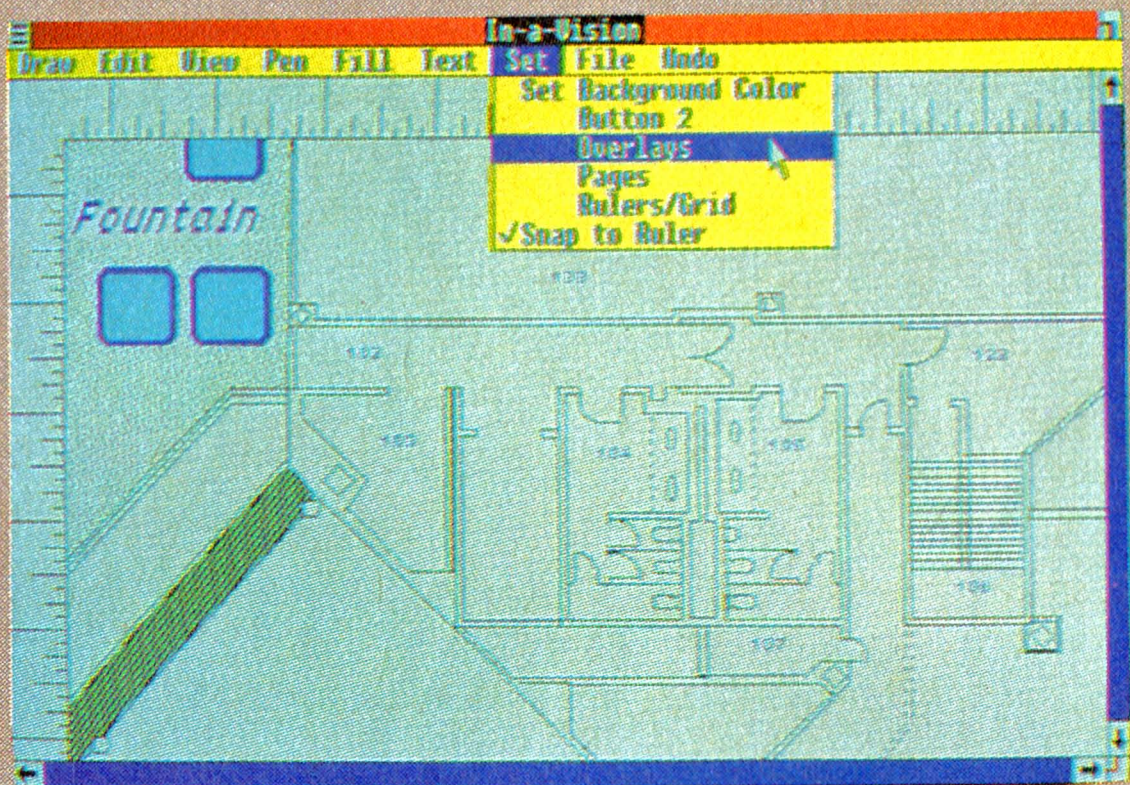
TWO TYPES OF BUSINESS GRAPHICS



TWO TYPES OF BUSINESS GRAPHICS



The lower sample, produced with Graphwriter and a Prism dot-matrix printer, would suffice for use among peers, but true presentation quality (top sample) demands more sophisticated hardware support (a color plotter) for the same software. (Courtesy Graphic Communications Inc.)



Micrografx's In-a-Vision produces sophisticated drawing features in an easy-to-use package that runs under Microsoft Windows. (Courtesy Micrografx Inc.)

MICROSOFT CHART

2.0 aims to serve a wide market base by accessing as many output drivers, input devices, and peripherals as possible—it supports over 60 peripherals. The program's strong suit is producing structured charts from numerical data; it's not designed for

free-form drawing, flowcharting, or intensive all-text images. Eight major chart types are available in 45 predesigned formats, and as many as 16 charts can be produced on one page. Moving, resizing, formatting, and positioning of text is easy and virtually unlimited—12 different

fonts are available in 255 point sizes. Chart also features eight built-in statistical functions, logarithmic scales, and axis-range controls.

Aside from its support for an extensive array of output options, Chart 2.0 can maintain a direct link to spreadsheet and database programs like Lotus's 1-2-3, Symphony, Multiplan, dBASE, or virtually any program that creates WKS, DIF, or text files. Once a permanent link is established between Chart and 1-2-3, for instance, the graphic image will automatically reflect your changes of the spreadsheet's data values, thus eliminating tedious manual updates. Chart is the only program covered in this article that offers this feature.

MIRAGE, AUTUMN, AND VR are companion modules from Zenographics that have the widest application of any of the presentation-graphics software considered here. They work with the majority of pe-

—Continued on page 107

FOR MORE SPECIFIC NEEDS

The seven graphics software packages reviewed in this month's Special Report are all excellent products for mainstream business graphics applications. Often, however, some business applications are more specific, demanding more specialized graphics software.

Although these specialized products cover a wide variety of applications, the four major ones are editing charts (enhancing basic charts and graphs), creating text slides or overheads, providing symbol libraries, and drawing (free-form or with basic predefined shapes). Here are some of the more successful packages in each of these areas.

GraFIX Partner (Brightbill-Roberts & Co., Suite 421, University Bldg., 120 East Washington St., Syracuse, NY 13202) is the best-known chart-editing package. Not only will it accept basic images from a variety of software, it will even run in the background with another graphics program. Other products that, among other features, provide capabilities for chart editing include 4-Point Graphics (IMSI Software Publishers, 633 Fifth Ave., San Rafael, CA 94901), VCN ExecuVision (Visual Communications Network, 238 Main St., Cambridge, MA 02142), and IMiGIT (Chorus Data Systems, POB 370, Merrimack, NH

03054). All of these help you produce effective, individualized presentation graphics.

Many presentations consist largely or even entirely of text images, either on slides or on transparencies for overhead projection. Decision Resources' SignMaster, mentioned in the Special Report, is well suited to creating such images, as are The Authoring Graphics System (Hypergraphics Corp., POB 50779, Denton, TX 76206) and Overhead Express (Business and Professional Software Inc., 143 Binney St., Cambridge, MA 02142). Both Hypergraphics and BPS also offer sophisticated presentation-graphics systems: The Presentation Graphics System and BPS Business Graphics, respectively.

Symbol libraries, which typically include an assortment of predrawn images along with capabilities for creating and storing your own symbols, are useful for adding some dazzle to presentation graphics. Instead of ordinary bars, for instance, your transportation-industry bar chart could be made of rows of cars, trains, and planes. GraFIX Partner and VCN ExecuVision, both noted above, provide this sort of enhancement.

Drawing—whether free-form or done with predefined pieces such as circles, polygons, and lines—is becoming a bigger part of the preparation of presentation graphics (probably because of the

wider use of that clever pointing device known as the mouse). IMSI's PC-Paintbrush (address above), Mouse Systems' PC-Paint (2336 H Walsh Ave., Santa Clara, CA 95051), and Micrografx Inc.'s PC-Draw (1820 North Greenville Ave., Richardson, TX 75081) provide basic drawing capabilities that tend toward the free-form approach. Chorus Data's IMiGIT (address above) also features drawing tools, and an impressive new system from Micrografx called In-a-Vision offers perhaps the widest array of drawing tools and conveniences.

As you may have noted, certain of these more specialized graphics products—such as GraFIX Partner, VCN ExecuVision, IMiGIT, and the pair of programs from Hypergraphics—fall in several of the four categories outlined at the start. One other product, released this fall, deserves mention on this score. Freelance, from Graphic Communications Inc. (200 Fifth Ave., Waltham, MA 02254) acts as a chart editor, a text-image creator, a symbol library, and, although a little short on free-form capabilities, a drawing tool. GCI made its name with Graphwriter (reviewed in the Special Report), and in adding Freelance, the company has created a graphics duo that aims to answer virtually any business graphics need.

—TOM MCMILLAN

INCREASING YOUR BUSINESS

I.Q. WITH ON-LINE DATA

*How to
retrieve
information
that can
give your
business a
competitive
edge*



BY TIM MILLER

IN MUCH THE SAME WAY THE French use pigs to sniff out truffles, businesses are using personal computers to unearth critical nuggets of information. Indeed, with your computer, you can dig through some 2700 on-line databases for virtually any kind of business information, whether you work for a giant company like Penn Central Corp., which spends half a million dollars a year on its data center, or a tiny operation like an Oklahoma City restaurant, which searches an on-line version of the local paper for news and information about reservation-holders.

Whatever your specific application, on-line information can provide a competitive edge. "People are going to make decisions with or without information," says Barbara E. Keiser, manager of information resources for Penn Central. "But having information means you're going to make a better decision."

Information may be even more valuable to a small firm than to a large firm, because by the time the large corporation makes a decision and acts on it, a small company has the chance to act quickly and outmaneuver it.

To benefit from on-line information, you don't need to learn how to use all 2700 databases. The half-dozen sources discussed here can provide all the information most businesses will ever need. These on-line sources offer three kinds of databases: *full-text* databases, which contain complete texts of newspapers and magazines; *bibliographic* databases, which provide indexes or abstracts of publications; and *reference* or *statistical* databases, which offer raw demographic or economic data and financial profiles of companies.

We've drawn up some guidelines to help you determine which databases fit your needs, which situations make retrieving on-line data cost-effective, and how to keep your costs down. (Information on the cost of these services and how to sign up for them is in the accompanying sidebar.)

The Latest News

Securities brokers, public-relations executives, crisis managers, and others who must be up-to-date on breaking news will find that speedy updating is the indispensable criterion for selecting databases. Dow

Jones News/Retrieval is particularly useful here, because it provides market information and the full text of selected stories from the *Wall Street Journal*, *Barron's*, and Dow Jones News Service as quickly as 90 seconds after they're filed.

Suburban Washington, D.C., financial planner Ronald L. West spends \$50 to \$75 a month to track 80 to 125 stocks on the Dow Jones service. He used News/Retrieval's Dow Jones News one evening to pull up stories bound for the next day's *Wall Street Journal*, found rumors of a possible takeover of Sperry Corp., and immediately telephoned clients to discuss investment strategies for the next day. "If you can get a one-night jump on that kind of news, it gives you a tremendous advantage," says West. News/Retrieval's *Wall Street*



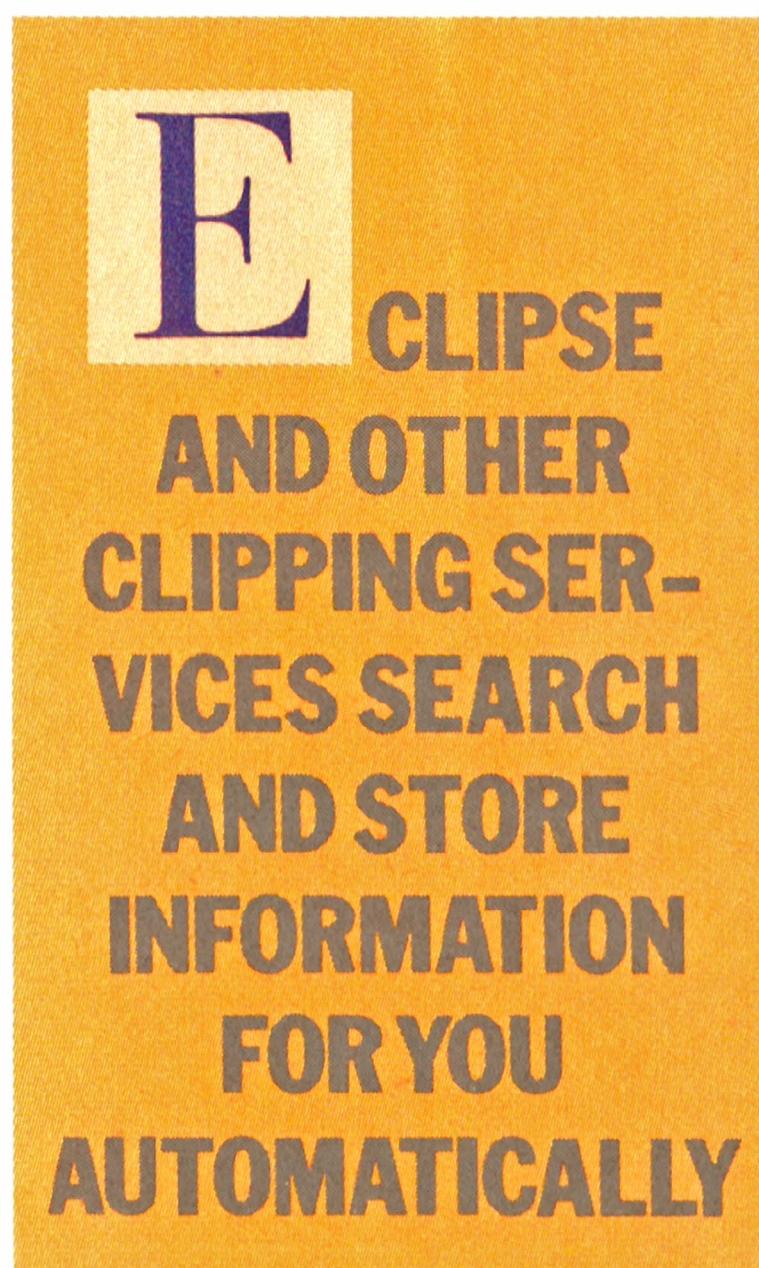
Journal Highlights Online gives headlines and brief summaries of the day's *Journal* stories by 6 a.m. Eastern Time.

Full-text databases like News/Retrieval are particularly well suited for late-breaking news because stories can be brought on-line quickly. Other full-text services include Mead Data Central's Nexis, which offers 140 magazines, newspapers, and newsletters, among them such general news sources as the *New York Times*, Associated Press, United Press International, and *Time* and general business publications such as *American Banker*, *Chemical Week*, and *Business Week*. Knight-Ridder Newspapers' Vu/Text provides full texts of the *Wall Street Transcript*, *Philadelphia Inquirer*, *Chicago Tribune*, *Detroit Free Press*, *Miami Herald*, and about 20 other newspapers, five of them in state capitals. Newspapers on both Vu/Text and Nexis are typically brought on-line within 48 to 72 hours of publication, magazines within several weeks.

Tim Miller is a freelance writer and occasional information broker in Arlington, VA. One of his specialties is writing about on-line databases.

But when summaries, abstracts, or simple citations of current news stories are all you need, bibliographic databases are the more efficient tools. Newsearch, a particularly useful index contained within the 220-odd databases in Dialog Information Services, provides next-day indexing of articles from some 1700 news and business publications ranging from *Tax Notes* to *Newsweek* to the *Los Angeles Times*.

If you need regular, continuous updates, electronic "clipping" services allow you to assemble a string of



words that are automatically searched for and electronically set aside daily, weekly, or monthly. Among those offering electronic clipping are Nexis (Eclipse), NewsNet (NewsFlash) and Dialog, whose SDI (Selective Dissemination of Information) service includes about 50 major indexes and other databases.

Hard-to-Find Information

On-line databases also are invaluable when you need to search far afield—across the Atlantic or through obscure domestic publications. Marketing managers, corporate planners, acquisition/merger specialists, product developers, and others who can't afford to miss one story that may be critical to their mission find that indexes and abstracts are especially useful for broad searches.

For example, Penn Central executives needed information on a United Kingdom battery company

they were considering acquiring, and their researchers found a wealth of data in Textline, a British database that contains abstracted articles from *Le Monde*, *Financial Times*, *Investors Chronicle*, and about 80 other publications in Europe and South America. "There's no way I would subscribe to the *Liverpool Echo*, but articles often appear there about U.S. companies with overseas branches," says Penn's Keiser.

Other sources of international information include Nexis, which carries several Asian news services as well as Reuters, the *Financial Times*, and a number of Latin American newsletters—all of which can be searched by individual publication or by type of publication (such as "newsletters" or "wire services"). News/Retrieval offers the full text of Japan's



Kyodo news service. International indexes on Dialog include Canadian Business and Current Affairs, which indexes 180 Canadian business periodicals and newspapers; Middle East Abstracts and Index, which abstracts more than 1500 English-language journals and reports; Mid-east File, which contains Arabic and English-language sources; and World Affairs Report, a digest of Soviet-oriented news.

If regional news tracking is important to your business, both Knight Ridder's Vu/Text, with its array of newspapers, and Oklahoma Publishing Co.'s DataTimes, with the *Seattle Times*, *Dallas Morning News*, *Daily Oklahoman* and *Times*, and several other newspapers, aim to network the country with regional databases that contain news and legislative and business information.

For instance, Campbell Soup Co. uses Vu/Text to track East Coast food trends, and Pennsylvania-based Sun Co. uses it to search the *Sacramento Bee* for political developments that might affect Sun's large West Coast land holdings. These services will become particularly valuable when the networks are expanded to

carry information from virtually every region of the country.

More than 100 local and regional business publications, such as *Crain's Cleveland Business* and *Rocky Mountain Business Journal*, are indexed in Newsearch. At the end of each month, the cumulative information is transferred to the Trade and Industry Index (Dialog, Nexis), an index that covers *American Drug-gist*, *Computerworld*, and about 340 other trade and business journals.

On-line research taps a world of obscure and specialized publications as well. NewsNet provides the full text of more than 200 newsletters, which range from *Japan High Tech Review* to *Toxic Materials News*. The newsletters, often compiled by reporters who have intimate daily access to their sources, offer a wealth of detail which, according to NewsNet's estimate, would cost more than \$50,000 a year to acquire from conventional hard-copy subscriptions.

You can also search on-line for hard-to-find investment information. By selecting Nexis's popular Exchange service and entering the name of a company, you have access to financial research reports written about that company by any of 30-odd investment banking and brokerage firms. Investext (NewsNet, Dialog) provides full-text reports from 27 leading investment banking firms. And Exchange and Disclosure II (Dialog, News/Retrieval) provide access to public companies' filings with the Securities and Exchange Commission.

The Needle in the Haystack

Computer-aided research is thorough because every word in an on-line article or citation is read by the database's computer. You can root out buried references to a subject in the text of an article, search abstracts and indexes for unindexed subjects, or sort out particular writers or publications. You can search all publications by entering a single word as a reference key, or you can use combinations ("strings") of words as keys—an impossible task in print researching. For example, by asking the computer to find text that included both the phrase "car wash" and the word "injury," DataTimes users were able to find several instances where people were injured by out-of-control spray wands at self-

AN ON-LINE DATA RESOURCE CENTER

The on-line services detailed here contain all the databases we mention in this article and will provide you with a good core of information for your business. All you need is a modem-equipped computer and about six hours a month to spend doing on-line research. You can easily adapt or expand this basic plan: specialized databases cover subjects ranging from advertising and marketing to finance, banking, computers, chemicals, and more. An excellent guide to databases is *Inc. magazine's Databasics: Your Guide to Online Business Information* (\$16.95; New York, Garland Publishing, 1984).

The hypothetical database budget proposed below will cost you about \$5000 a year in sign-up and usage charges. If you need to start smaller, begin with Dialog (perhaps the best all-purpose database) and build from there.

1	Dow Jones News/Retrieval POB 300, Princeton, NJ 08540, (800) 257-5114. Valuable for stock data and background on publicly held companies. Menu-driven system is easy to use; full text less easy to search. Costs: Initial charge: none; monthly charge: none; On-line charge: 90 cents/minute peak; 20 cents/minute off-peak. (Nine databases carry a 30-cent surcharge on peak, eight carry a 60-cent off-peak surcharge. Charges are double for both 1200 and 2400 baud.) Monthly use of 1.5 hr. at basic rate:	\$ 81
2	Dialog Information Services 3460 Hillview Ave., Palo Alto, CA 94304, (800) 334-2564. More than 200 separate databases provide a treasure trove of reference, bibliographic, and statistical data. Vastness makes it difficult for all but regular users to search in a cost-efficient manner, though Pro-Search menu-driven software (Menlo Corp., Suite 400, 4633 Old Ironsides Dr., Santa Clara, CA 95054; \$495) simplifies searching Dialog (and all other on-line databases). Costs: Initial charge: none; monthly minimum: none; Per-minute rates: from 42 cents to \$5. Monthly use 1.5 hr. at \$1.40/min:	\$126
3	Dialog's Knowledge Index Address above, (800) 227-5510. Selected databases from Dialog. A valuable index tool that is easy to use and billable only to a credit card. Costs: Initial charge: \$35; monthly minimum: none; per-minute fee: 40 cents. Monthly use of 2 hr. at \$24/hr.,	\$ 48
4	NewsNet 945 Haverford Rd., Bryn Mawr, PA 19010, (800) 345-1301. Valuable source of data from specialized newsletters, especially in investment, computers, and telecommunications. TRW business credit profiles. Sluggish response time wastes on-line dollars. Costs: Initial charge: none; monthly charge: \$15; per-minute fee: 40 cents to browse; 80 cents to \$2.40 to read. 25 percent reduction for off-peak usage. Monthly use of one-half hour at an estimated average rate plus \$15/mo. set charge:	\$ 45
5	Vu/Text Information Services 1211 Chestnut St., Philadelphia, PA 19107, (800) 258-8080. Good source of regional information from more than 25 newspapers. Stock quotes from <i>Wall Street Transcript</i> . Easy to use. Cannot search all publications at one time. Value will grow as database becomes nationally representative. Costs: Initial charge: none; monthly charge: none; per-minute fee: \$1.25 to \$1.66. Monthly use of one-half hour at average rate:	\$ 44
6	Third-Party Searches or use of other database	\$ 70
Total monthly bill:		\$414

Total for a year: \$4968. If same usage takes place at off-peak rates, the monthly bill will be \$339.75 and the yearly bill \$4077, an 18 percent savings over daytime rates. Some databases also offer discounts for volume use.

OPTIONAL:

Nexis

Mead Data Central, 9393 Springboro Pike, POB 933, Dayton, OH 45401, (800) 227-4908. Nexis, with full text of about 140 periodicals, is the undisputed Cadillac of full-text databases, but its \$50 monthly charge makes it difficult to justify for an average-sized business. For that reason, I recommend using Nexis through an information broker as the need arises or sharing Nexis with another organization (billings can be broken down by name of project). **Costs:** Initial charge: \$145 to \$249 for software used with own terminal; \$200 used with Mead terminal; monthly charge: \$50; on-line charge: \$7 to \$21 per search; 33 cents a minute thereafter to browse. \$3 for each modification of a search.

DataTimes

818 N.W. 63rd St., Oklahoma City, OK 73116,

(800) 642-2525. DataTimes offers the AP Newswire and full text of six newspapers. Unless you need regular information from Seattle, Oklahoma City, Baton Rouge, Dallas, or Little Rock, it is difficult to justify the \$10 to \$50 monthly minimum charge. **Costs:** \$10 to \$50 monthly minimum fee, 83 cents to \$1.33/minute, depending on volume of use.

Textline

Finsbury Data Services Limited, 68/74 Carter Lane, London, EC4V 5EA, England, 01-248-9828. Textline abstracts about 80 newspapers in Europe and South America, half of them from the United Kingdom. Most abstracts are added by 8 a.m. Eastern Time the day of publication. All information is translated into English. **Costs:** \$120/hr. including phone charges.

service car washes.

This "superindexing" ability is especially valuable for such diverse projects as keeping track of competitors, assembling a complete account of public remarks or biographical information on someone, assembling a complete profile of a company, checking to see if a trademark is in use, or tracing an obscure quotation.

Such computerized searching came in handy for researchers at Access Innovations in Albuquerque, New Mexico. Access Innovations was approached by an Illinois firm interested in doing business with "mystery man" financier Edmond Safra, an Israeli born in Lebanon, who lived in Canada and France. Researchers tapped databases like Textline and found society-column and news references to Safra's charitable activities and social credentials. Reassured as to his solidness, the firm proceeded with the deal.

Nexis allows a keyword search of all publications it contains, and its full-text versions of *Forbes* and *Fortune* provide you with valuable facts about public companies; *Inc.* magazine (also on Nexis) is similarly rich in information about privately held firms. Nexis's Lexpat, with full text of all U.S. patents, lets you find each patent associated with a particular firm or individual.

Keyword searches also turn up references too new to be indexed conventionally or that are indexed in obscure ways. "If it's the cutting edge of technology, you're not going to get it on paper," says Access Innovations president Marjorie M. K. Hlava, who noted that CD-ROM optical-disk technology, for example, is often indexed under laser physics. Computer searching also allows managers to find trendy buzzwords that wouldn't appear in an index.

A Managerial Focus

Searching by keyword also applies to indexes and abstracts. If you're a manager, you will probably want to search the abstracts of the *Journal of Management*, *Employee Benefits Journal*, and 600 other management-oriented publications abstracted on ABI/Inform (Dialog, Vu/Text, Nexis). About 500 management-oriented publications—roughly the same ones as in ABI/Inform but less thoroughly indexed—are also available in Management Contents (Dialog,

Nexis). As noted earlier, references to specific industries can be found in the Trade and Industry Index. Marketing and product information—especially for international companies—is available from the 1200 business periodicals abstracted in Predicasts' PTS F&S Indexes (Dialog). Industry Data Sources (Dialog, Nexis) culls 2100 business and trade journals for sources of numeric data on a wide range of industries.

If you're looking for only a few general references to a subject, you may want to use a paper copy of the Trade and Industry Index at the library rather than pay \$1.40 a minute to access it on Dialog. However, Dialog's after-hours service, Knowledge Index, offers the Trade and Industry Index, Magazine Index (which covers 435 general publications like *Science*, *Vogue*, and *Life*, ABI/Inform, Newsearch, and other indexes on computers, engineering, and corporate news at the greatly reduced rate of 40 cents a minute.

It is impossible to discuss the versatility of electronic searching without mentioning the manipulations that you can do with statistical and reference databases. Corporate acquisitions specialists, for example, in search of firms that are ripe for takeover, can use News/Retrieval's Media General Financial Services to display a company's financial records side-by-side with those of similar companies or with the industry as a whole. Dun's Market Identifiers (Dialog) gives information about some two million U.S. firms with 10 or more employees; from that list market researchers can compile, for instance, all typewriter dealers in a certain zip code area who have \$100,000 or more in revenues. You can also make similar use of the Electronic Yellow Pages (Dialog), a comprehensive listing of small businesses compiled from almost every Yellow Pages directory in the nation.

An On-line Data Center

Once you decide to use on-line databases in your business, you have several choices. You can set up your own on-line resource center, you can employ the services of an information broker, or you can opt for a combination of the two.

The purchase price of equipment is not the main consideration in determining the cost-effectiveness of

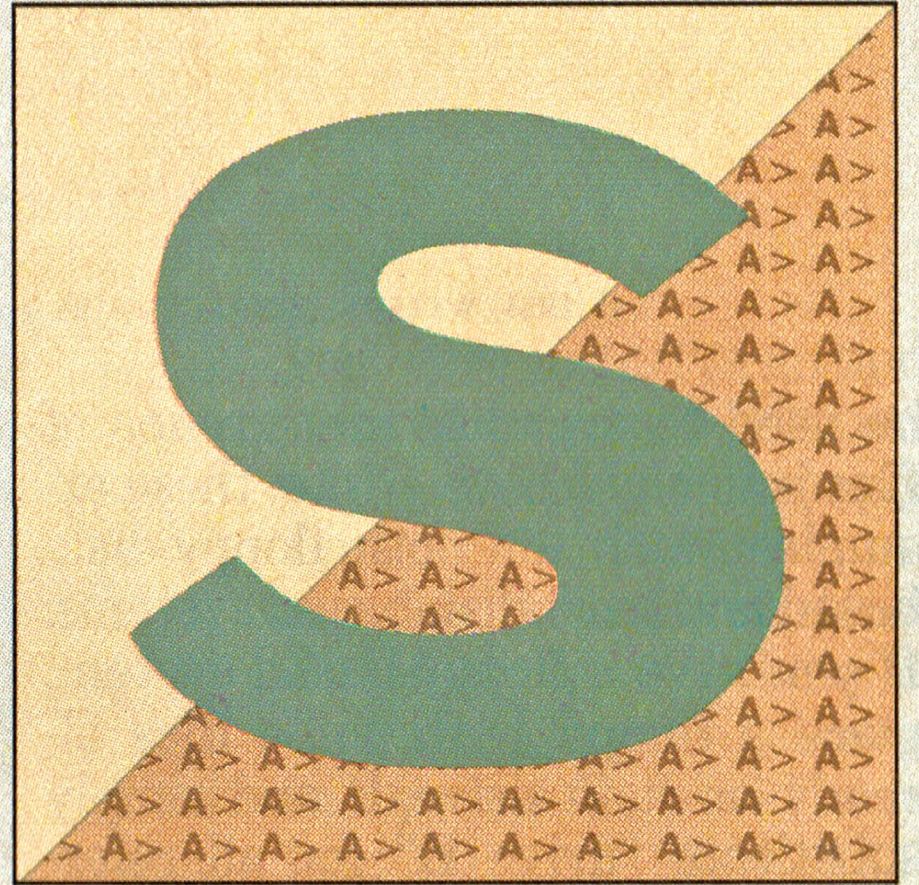
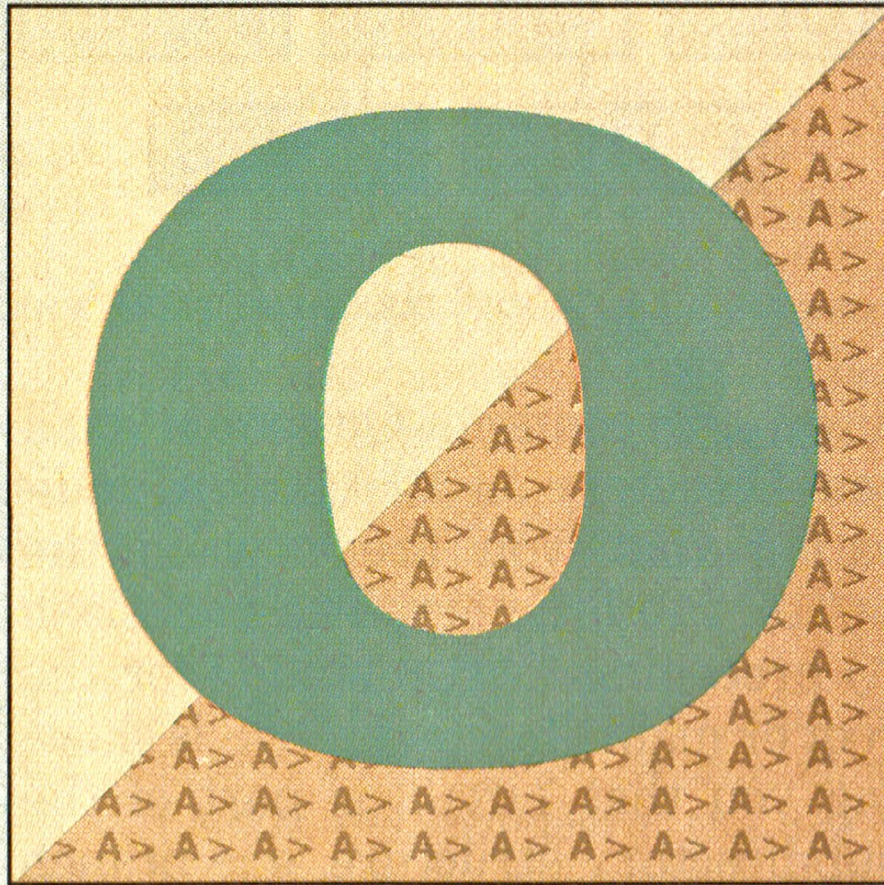
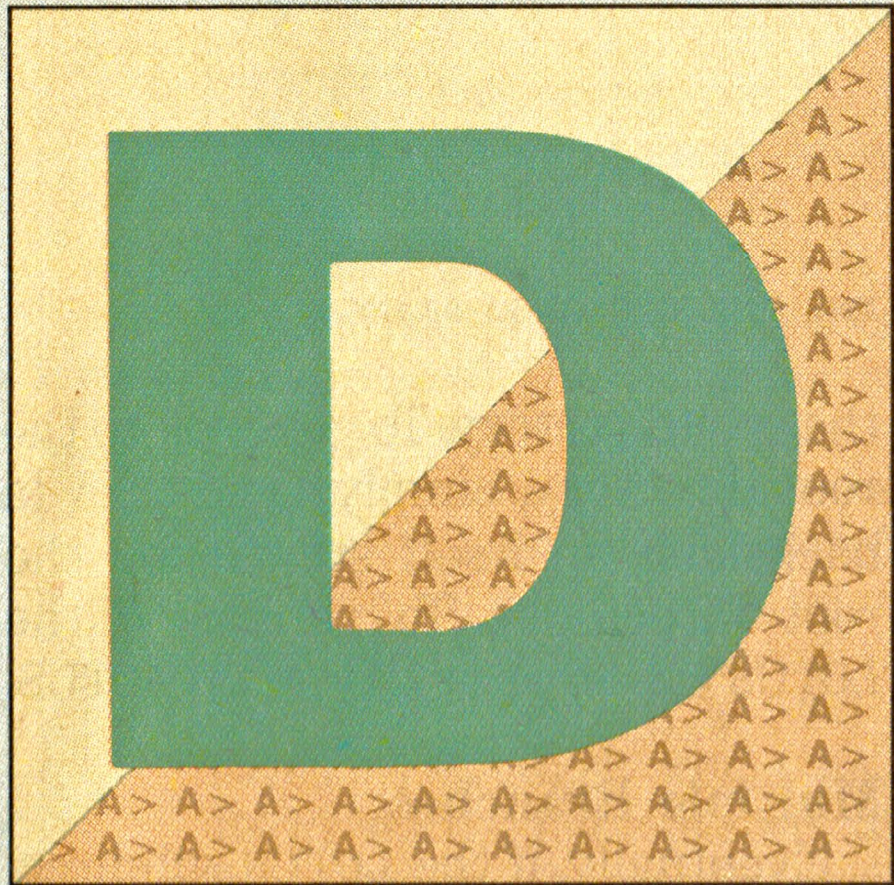
an in-house data center; all you need is a personal computer equipped with a modem. Instead, the high costs of databases, combined with connect-time charges and the time you spend in conducting a search, are critical in deciding when and how to use on-line information. These facts demand that you answer some questions about the nature of your information use:

- How critical is on-line data to your organization? If you're a venture capitalist and you're looking for new and emerging trends, for example, it's worthwhile to set up your own center, according to Kathleen Pendergast of the Chicago Public Library's Computer-Assisted Reference Center.
- How focused are your information needs? "If yours is a specialized business or subject area that you live and breathe all the time—hog bellies, for instance—then it's cost-effective for you to get the appropriate database dealing in hog bellies and search it yourself," says Find/SVP president Kathleen Bingham. "But if you're wandering around in new subject areas figuring out where you're going to sell your new mousetrap, it is probably more efficient to go through a data broker."
- What's your organization's amount of on-line use? Bingham estimates that you need to log 12 to 15 on-line hours a week in order to reach peak efficiency in searching a database. "At \$180 an hour you just can't fumble around," agrees Lois Warren, an information broker in Vancouver, B.C.

Yet the expertise of professional searchers is expensive, and your search needs may not warrant the cost. Information brokers charge hourly rates of \$25 to \$90 in addition to passing on connect-time charges. Searches average in the neighborhood of \$200, but the range is from \$50 to several thousand dollars, depending on how much time the searcher spends in added library or telephone research. A less expensive alternative is to use public libraries, ranging from Chicago's to the one in Arlington County in suburban Washington, that offer certain databases at fees designed to cover only connect-time costs. University libraries, if they don't do custom searches for

—Continued on page 104

GETTING MORE FROM



BY SETH GREENBERG

IF, LIKE MANY BUSINESS USERS, YOU'VE COME to view MS-DOS or its IBM cousin, PC-DOS, as a necessary evil, you may be surprised to learn that—lurking beneath its unfriendly surface—DOS offers easy-to-use, powerful features that can simplify many of your usual, laborious DOS chores. These features streamline moving, copying, and searching for disk files, eliminate repetitive typing of commands, and more. In short, DOS can make your computer more manageable.

For example, even if you've been using a computer for only a short time, you probably already have doubts about the DIR ("directory") command. When you type DIR to examine the contents of a disk full of files, all you get is a disorderly array of cryptic file names running up the screen. The problem becomes critical with hard disks, which typically store from 5 to 30 million bytes of data: typing DIR for the total contents of a hard disk can throw even the most organized mind into confusion as endless spreadsheet, word-processing, database, and telecommunications files scroll by, all mixed together.

There is a better way. In fact, there are several. This month, we'll look at DOS subdirectories, an easy way to keep all your on-disk files organized and accessible. Next month, we'll examine batch files, ways to automate any series of DOS commands for efficient and error-free execution.

Putting Your Files in Order

DOS can help you get organized with one of its most powerful features—subdirectories. With subdirectories, you divide your files, usually according to application, into smaller, more logical, and more manageable subgroups. Subdirectories are a virtual necessity for keeping the contents of a hard disk organized, but they also can help with floppy disks, especially if you plan on upgrading to a hard disk at some future time.

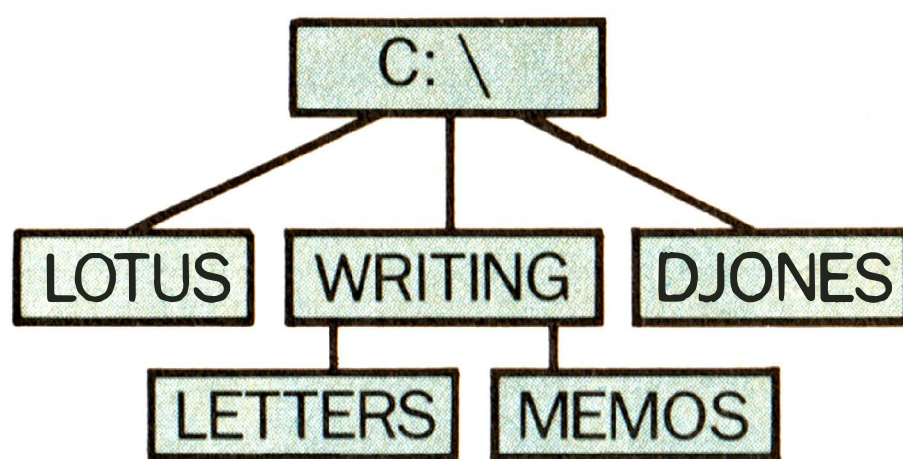
A disk with subdirectories is divided into separate sections for word processing, spreadsheets, data management, and so on. Each section has its own subdirectory—a list of all the files and perhaps an application program it contains—and the disk as a whole has one main directory. When you want to find a file in a specific section, you look it up in that

section's subdirectory, bypassing everything else. The main directory is called the "root," and subdirectories "branch off" the root (see illustration next page). This creates a hierarchy of directories, with the main or root directory "on top" and any number of levels of subdirectories "underneath."

The easiest way to understand subdirectories is to see them in action, so try the following examples on any computer running MS-DOS or PC-DOS version 2.0 or higher. While these examples are specific, the techniques they demonstrate are general and can

PART ONE:

**Organize and
manage your files
with advanced yet
easy-to-use DOS
commands**



A DISK WITH SUBDIRECTORIES HAS ONE MAIN OR "ROOT" DIRECTORY FROM WHICH THE SUBDIRECTORIES BRANCH.

be used to organize any groups of files you might have. (Note: these examples work for both floppy-disk-based and hard-disk-based systems. If you have a floppy-based system, place a floppy with some files already on it in drive B and simply substitute "drive B" for all references to "drive C.")

Creating a Subdirectory

To begin, let's assume your hard disk (drive C) contains mostly DOS files in a single directory (the directory you see when you type DIR after the C> prompt—the "root"). Say you just bought a copy of Lotus 1-2-3, and you don't want your 1-2-3 program and data files mixed up with your other files on disk. Here's how to keep your Lotus files (or any other group of files, for that matter) separate by installing them in their own subdirectory:

The command to create a new subdirectory is MD, which stands for "make directory." You'll have to give your new directory a name when you create it, abiding by the same rules DOS imposes for file names—eight characters maximum, plus an optional three-character extension. Simple, obvious names are easier on your memory: a good name for a Lotus 1-2-3 subdirectory is LOTUS. To create the subdirectory, simply type MD LOTUS after the C> prompt. That's all there is to it.

Now type DIR and you'll see a new addition to your root directory listing: the words LOTUS <DIR>, indicating that a subdirectory named LOTUS now exists.

Let's examine the contents of the new subdirectory: type CD LOTUS, then DIR. The command CD stands for "change directory" and tells DOS you want it to move from the directory that's now active (the "default" directory; in this case, the root) to the directory you specify (in this case, LOTUS). DIR, of course, lists the

directory's contents. On-screen you'll see Directory of C: \LOTUS, indicating that you are now in the LOTUS subdirectory. The backslash (\) preceding LOTUS stands for the root or main directory; DOS is showing you that LOTUS is part of the subdirectory structure, one branch or level away from the root.

Since you've just created the subdirectory, it contains no files. However, subdirectory listings always automatically contain at least two entries to help you remember where you are. The entries ". <DIR>" and ".. <DIR>" indicate that in addition to the directory you're in, there's at least one more level of directories above you. In this instance, of course, the level above you is the main directory, or root.

Moving Files

There are several ways to copy your Lotus files into the new subdirectory. Because you are still in the LOTUS subdirectory, the simplest method is to place your 1-2-3 source disks in the A drive and type COPY A:*. * (see the sidebar for an explanation of the asterisks). DOS will copy everything on the A drive into the LOTUS subdirectory.

Another way is to move to the A drive by typing A: at the C> prompt. DOS remembers that you were last in the LOTUS subdirectory on drive C (that is, it remembers that \LOTUS is now the C drive default directory), so the command COPY *. * C: is all you need to copy drive A's files into the LOTUS subdirectory. You can use either of these basic procedures to install any or all of your application programs on your hard disk.

When you return to drive C (by typing C: after the A> prompt), DOS will automatically put you back in the LOTUS subdirectory. Now you can use your 1-2-3 program normally, and when you do so, your work will automatically be saved in the LOTUS branch and will not appear in

the root directory. To get back to the root directory, simply type CD \ (a backslash by itself stands for the root directory). To return to the LOTUS subdirectory, type CD LOTUS.

Multiple Branches

Eventually, if the LOTUS subdirectory becomes crowded with files, you can branch from the LOTUS subdirectory by creating another subdirectory from it—a subdirectory of a subdirectory. It's not as complicated as it sounds. Let's look at a new example: first, we'll create a subdirectory to hold a word-processing program and its files; then we'll branch into another subdirectory created specifically for letters.

Put your word-processing disk in drive A and type C:\ to get to your hard drive's root directory. Type DIR to see what's already on the disk. Type MD WRITING to create a new subdirectory called WRITING. Type DIR again to make sure the new subdirectory's there; it'll appear as WRITING <DIR> in the root directory.

Now we'll copy all the files from your word-processing disk into WRITING. When we did this before with LOTUS, we first changed directories, then used the COPY command. This time, we'll save time by copying in one step. The trick to one-step copying is using a "pathname" to tell DOS how to find the subdirectory where the copied files will go. A pathname literally tells DOS what route or "path" to follow to get from the root to the appropriate subdirectory; in form, it's simply a subdirectory name plus a backslash.

Here's how it works: After the C> prompt, type COPY A:*. * C:\WRITING. The pathname, \WRITING, directs DOS into the subdirectory structure, then to WRITING, even though you're not in that subdirectory. You can use this same process to copy any files on floppies into WRITING from drive A.

Let's switch to WRITING to view

Seth Greenberg, a freelance writer in New York, teaches classes in business applications software.

WILDCARD TIMESAVERS

What would you do if you needed to copy all of your 1-2-3 graphs from a disk packed with not only spreadsheet work but WordStar and backup files? The only efficient solution: get into DOS and take advantage of its ability to move selected groups of files with a "wildcard." For example, an asterisk can be used in place of any group of characters.

In your directory, a 1-2-3 graph saved as BAR286 would be listed BAR286.PIC. You could copy all .PIC files from the B to A drive with the simple command `COPY *.PIC A:`. If you wished to copy to the A drive with the A > prompt on-screen, the command would be `COPY B:*.PIC`.

If .BAK WordStar files are cluttering up your hard disk, you could first copy them to an archive floppy disk with `C>COPY *.BAK A:` (type `C>DIR A:*.BAK` to confirm), then erase them from the hard disk with `C>ERASE *.BAK`.

In each case, the wildcard (*) saves

you from typing numerous file names.

Since programs such as WordStar or PFS:Write don't automatically add extensions to file names, plan ahead by creating your own. For instance, if you were maintaining extensive correspondence with one particular government agency, you might name files such as LETTER1.IRS, LETTER2.IRS, etc., for later file manipulation.

Thinking ahead when naming files is also a good practice with another helpful DOS wildcard, the question mark, which substitutes for any single character. Microsoft Word files named REPORT1.DOC, REPORT2.DOC, REPORT3.DOC could be copied from the B to A drive with `B>COPY REPORT?.DOC A:`. If you've spelled a filename incorrectly, `B>COPY R?PORT?.DOC` would also work.

You can even combine the two wildcards: `A>DIR B:*.?85` would list files such as BUDGET.185, BANK-BDGT.585, and so on.

you were in LETTERS and wanted to copy VENDORS to the A drive, you'd simply type `COPY VENDORS A:` and the job would be done. But if you were in the root directory, the fastest way to copy the file would be to type `COPY \WRITING\LETTERS\VENDORS A:` (notice that VENDORS is preceded by a slash when included in the pathname).

Shortcuts

At this point you probably sense how easy it could be to get lost in a maze of subdirectories. Not surprisingly, for many people, this is the most difficult area of DOS. Practice helps, but so does DOS.

- A very handy trick is to change the DOS prompt

the subdirectory's contents. Type `CD WRITING` to move into the subdirectory, then `DIR`. You should now see your word-processing files inhabiting the subdirectory. As before, `". <DIR>"` and `".. <DIR>"` indicate that you're in a subdirectory and that another level exists above.

Now let's branch from WRITING by creating a subdirectory from it called LETTERS. Type `MD LETTERS`. (If you were in the root directory, you could have accomplished the same task with a two-level pathname: `MD \WRITING\LETTERS`. A backslash must separate each subdirectory name when you're on the root directory level.)

Pick one of your word-processing files and move it to LETTERS. Let's say the file is called VENDORS (any name will do—this is just an example). Because you're already in the WRITING subdirectory, to copy VENDORS to LETTERS, all you have to do is type `COPY VENDORS LETTERS`. In this command, LETTERS is very much like a destination drive in the disk-to-disk copying command you're already familiar with (i.e., `COPY`

`VENDORS B:`). Notice that no backslash is placed before LETTERS: if you added the backslash, DOS would think LETTERS was a branch off the root directory. To put it another way, once you're in the subdirectory structure ("below" the main directory) and merely moving down one level, no backslash is needed.

Now check to make sure the COPY command worked. Type `DIR LETTERS`, and VENDORS should appear in the listing. If you were at the root directory level, you could check the content of LETTERS by either changing directories (`CD \WRITING\LETTERS`) and typing `DIR` or, more simply, by typing `DIR \WRITING\LETTERS`. The former case would leave you in the LETTERS subdirectory, the latter would leave you in the root. But both ways work: both show you that VENDORS is now in the LETTERS subdirectory.

As you can see, there's usually more than one way to accomplish whatever it is you want to do in your subdirectories. The best command to use depends upon where both you and your files are. For instance, if

(e.g., `C>`) into something more informative. At any > prompt, simply type `PROMPT $P$G`, and the prompt will then expand to include a line of text telling you what subdirectory you're in, as well as what drive is active. For example, if you're in the LETTERS subdirectory, the DOS prompt would be `C:\WRITING\LETTERS>`. This makes it much easier to remember where you are in your file structure.

- If you ever do get lost in your subdirectories, simply type `CD` with no backslashes and no subdirectory names: DOS will tell you the name of the directory you're in.

- To get a listing of all your directories, type `TREE C:` from a root directory containing your DOS files.

- To get a listing of all your directories plus the names of the files each directory contains, follow the previous example but type `TREE C:/F`.

- If you have more directories and/or files than will fit on your screen, you can obtain a paper printout of your directory structure by typing

—Continued on page 106



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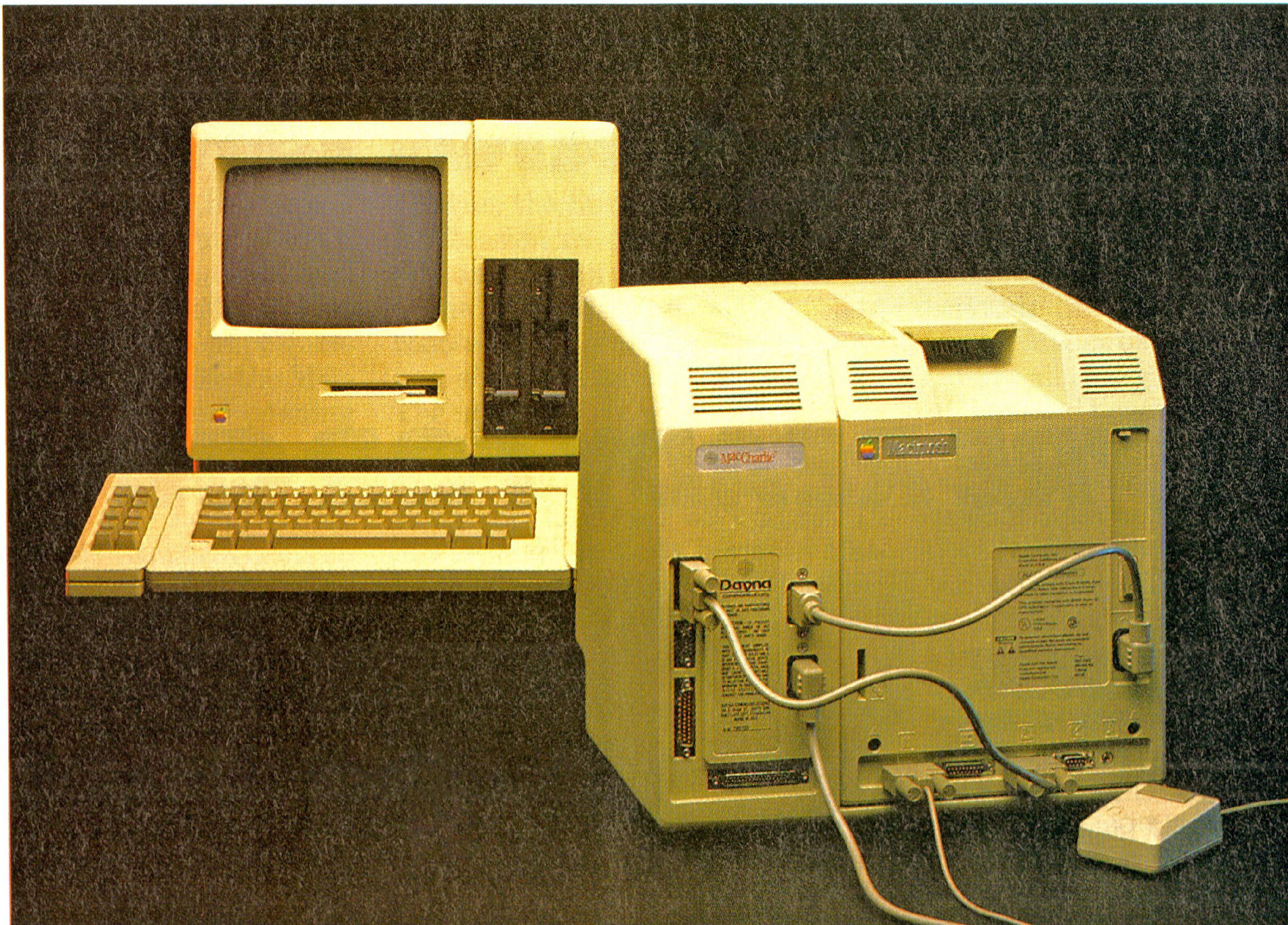
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MacCharlie

At last, an add-on that transforms Apple's Macintosh into an integrated system that's compatible with the IBM PC

It sounds too marvelous to be true. But inside this little beige box is the product of some true technological wizardry that, for the first time ever, unites the two giant incompatibles—IBM and Apple—to let you run PC programs on your Macintosh.

MacCharlie, with its 8088 central processor, 640K bytes of RAM, and two 5¼-inch floppy-disk drives, is actually a separate computer that uses the Macintosh as a terminal when you're running programs written for the IBM PC; when you're running Macintosh programs, MacCharlie stays out of the way. Yet, the two act as one system—you can boot up both the Macintosh and MacCharlie's MS-DOS by turning on one switch, and you can move easily from a Macintosh application to an MS-DOS application.

MacCharlie has three parts: a base that the Macintosh sits on, a system unit that houses the main circuitry and disk drives, and a U-

shaped keyboard that adds 10 function keys on the left of the Macintosh keyboard and an 18-key numeric keypad with arrow keys on the right. The system unit is the same height and depth as the Macintosh, and when set up beside the Mac, it adds only 10.8 inches to the width of the Macintosh. All three parts are the same color as the Macintosh and are designed to look as if they might have come from the same factory.

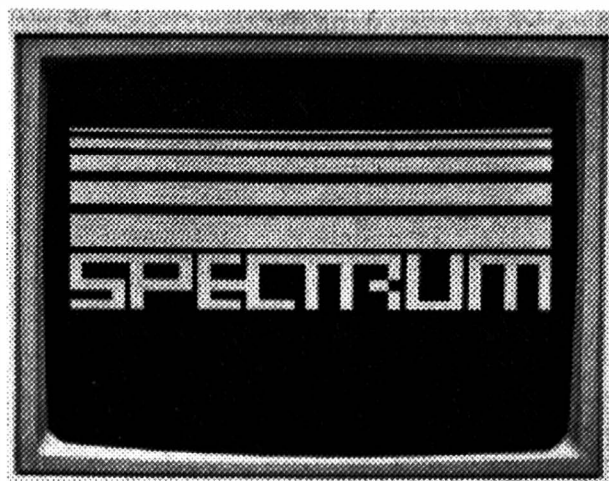
It takes about 15 minutes to put it all together. You snap the base to the left side of system unit, set the Macintosh atop the base snuggled up next to the system unit. Next, you connect a power cord so that the two units can use the same AC outlet, and you connect one end of a cable to one of MacCharlie's two serial ports and the other to the Macintosh printer port. Finally, you slide the MacCharlie keyboard extension over the Macintosh keyboard and connect the two. You can also plug

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the ImageWriter printer cable into MacCharlie, which leaves one serial port free for a modem or for the expansion chassis that the manufacturer, Dayna Communications of Salt Lake City, Utah, says will soon be available.

According to Dayna, that expansion chassis will allow you to add a hard disk, a parallel port, additional serial ports, more RAM, and so forth—all of which are impossible now, since MacCharlie, like the Macintosh, is a closed box and opening it voids the warranty. Networking capability is also promised by the manufacturer. But for now, the only add-on your dealer can provide is an 8087 numeric coprocessor chip.

Booting Up

You boot the entire system with two supplied disks—you put a MacCharlie MS-DOS boot disk in its drive A and a MacCharlie Macintosh disk in the Mac's internal drive. Right away your Mac screen displays the MacCharlie icon and a menu with six options, including Eject and Shut Down. To run MS-DOS programs or to transfer files between the Macintosh and MacCharlie, you just select the MacCharlie icon. The MacCharlie application appears as a Macintosh window through which the MS-DOS programs are displayed. And not only does MacCharlie provide IBM PC compatibility, you can even use some of the Macintosh user interface features.

The menu bar at the top of the MacCharlie window offers you four pull-down menus: File, Edit, Commands, and Keyboard. The File menu is used for transferring entire files to and from the Macintosh and MacCharlie and for page setup and printer selection. The File menu also includes the Quit option, which lets you stop running MacCharlie. The Edit menu shows the seven typical Macintosh commands: Undo, Cut, Copy, Paste, Clear, Select All, and Hide Clipboard, but only four—Copy, Paste, Select All, and Hide Clipboard—are active within MacCharlie applications. The Commands menu includes Record Lines Off Top, Clear Lines Off Top, Restart MacCharlie, and Pause MacCharlie. When

you opt to record the lines that scroll off the top of the MacCharlie window, the system stores them in a file called "maccharlie.log," which you can review at any time using the vertical scroll bar on the MacCharlie window. Each time you start MacCharlie, the lines saved during the last session are displayed in the window and remain until you clear them.

The Keyboard menu allows you to choose MacCharlie or Macintosh keys and show the keyboard on screen. The number keys, the enter key, and math keys on the MacCharlie keyboard work in Macintosh applications, but the cursor keys do not. In MS-DOS applications, however, MacCharlie sometimes displays lowercase letters as uppercase, and pressing Caps Lock does not remedy the problem. Fortunately, the Resynch command in the menu corrects the display—albeit in a clumsy way.

Running with MacCharlie

WordStar was the first program I tried running on MacCharlie. It booted right up, although it looked a little strange—portions of the screen were in reverse video. That peculiar display was created because MacCharlie expects applications to be set up for a monochrome display, not a color-graphics display. Still, though, I was able to use WordStar just as I would on an IBM PC, and even my preprogrammed function keys worked.

But not all was perfect. The main problem was the slow rate at which MacCharlie repaints the Macintosh screen. In fact, you can type a couple of words ahead of the display—a big problem for all but the slowest of typists. In addition, I wasn't able to hold down the arrow keys to scoot the cursor across the screen—each time I tried, the keyboard buffer quickly filled and the cursor stopped. Only when the keyboard buffer alarm stopped beeping did the cursor start moving again. Although you can use the Macintosh's mouse to select and highlight a block of text, the only way to move the cursor is with the arrow keys.

MacCharlie is so slow because of the way it uses the Macintosh as a terminal. Unlike an IBM PC, which writes screen changes directly to its

video RAM and updates the display many times a second, MacCharlie's display data follows a complicated course. First, the data is written to MacCharlie's video RAM, where the data is analyzed by a resident program. Then the data is transmitted serially to the Macintosh's printer port. Once the Macintosh has the data, the MacCharlie application software finally writes the changes to the Macintosh screen.

With all that going on, it's easy to understand how the display falls behind. To Dayna's credit, however, MacCharlie has a way of letting the display catch up. Whenever the display falls behind because of rapid screen changes, MacCharlie stops sending data until it senses the last screen change. For example, if you use a word-processing program and try to scroll three or four pages by hitting the PgDn key several times, MacCharlie will display only the last page—skipping the other pages.

The time taken to repaint a screen varies with the application, depending on how that program writes to the screen. It took several seconds to display the menu screen for Borland's SideKick—on an IBM PC the menu appears instantly. And MacCharlie took nearly three times as long as the IBM PC to display a 20-file disk directory—even though the MacCharlie's disk access speed is actually more than 30 percent faster. A spokesperson for Dayna says the manufacturer is concerned with MacCharlie's slow screen painting and expects to improve the speed with a future release of the MacCharlie software.

Making the Transfer

After testing WordStar, I tried transferring text and files between the Macintosh and MacCharlie. First, I started up Managing Your Money, a popular program written for the IBM PC and not yet available on the Macintosh. Using the mouse and pull-down menus, I copied a block of text to the Macintosh clipboard, switched disks, booted up WordStar again, and pasted the text into a WordStar file. The text came in slowly, producing a key click with each character and sounding like a telegraph office. Nonetheless, it worked.

Then I copied the file to the clipboard, left WordStar, closed up the MacCharlie window, and opened up MacWrite.

Once in MacWrite, I pasted the combination WordStar and Managing Your Money file into a MacWrite document with no problem. You can use the clipboard to transfer text as easily in the other direction as well—that is, from Macintosh to MacCharlie.

any data that MacCharlie tries to send to the screen will not be displayed. Or you can drop MacCharlie entirely and have a plain vanilla Macintosh again—with one difference. Whenever you print a document from the Macintosh, it goes first into MacCharlie's RAM for temporary storage. As long as MacCharlie is not holding an application in RAM, you can use the memory as

two very different operating systems. But that's something you could do using a low-cost IBM PC compatible such as the Tandy 1000 with a cable and communications software. A comparably equipped Tandy 1000—including a separate monitor—would cost only about \$100 more than MacCharlie, and other IBM PC compatibles could be even less.

Of course, you can use MacCharlie just to run MS-DOS programs—after all, it is data compatible with the IBM PC. Better still, in our benchmark tests MacCharlie ran slightly faster than an IBM PC. But you'll probably find the slow screen painting intolerable. And then there's the issue of color-graphics compatibility—for now, MacCharlie has none.

MacCharlie does live up to its manufacturer's claims. But for its almost \$1800 price tag you can buy a complete IBM PC-compatible system that could be easily expanded and wouldn't make you wait to see a display. If MacCharlie were less expensive—much less—the convenience of having an integrated system that can cut and paste both Macintosh and some IBM PC applications data might justify the premium you pay for waiting on a display.

At MacCharlie's current price, however, buying a second computer makes more sense for several reasons. First, if either system goes down, the other keeps running. But if you buy MacCharlie and your Macintosh breaks, you're out of business. Second, you can't expand MacCharlie by simply adding a plug-in board; you would have to wait to buy the not-yet-released expansion chassis. Even worse, if you wanted IBM PC color-graphics compatibility, you would also have to reckon with the additional cost of a monitor—a cost you might have hoped to avoid with MacCharlie. And finally, two separate systems could handle twice the input and, more important, produce twice the output of a single integrated Macintosh/MacCharlie system.

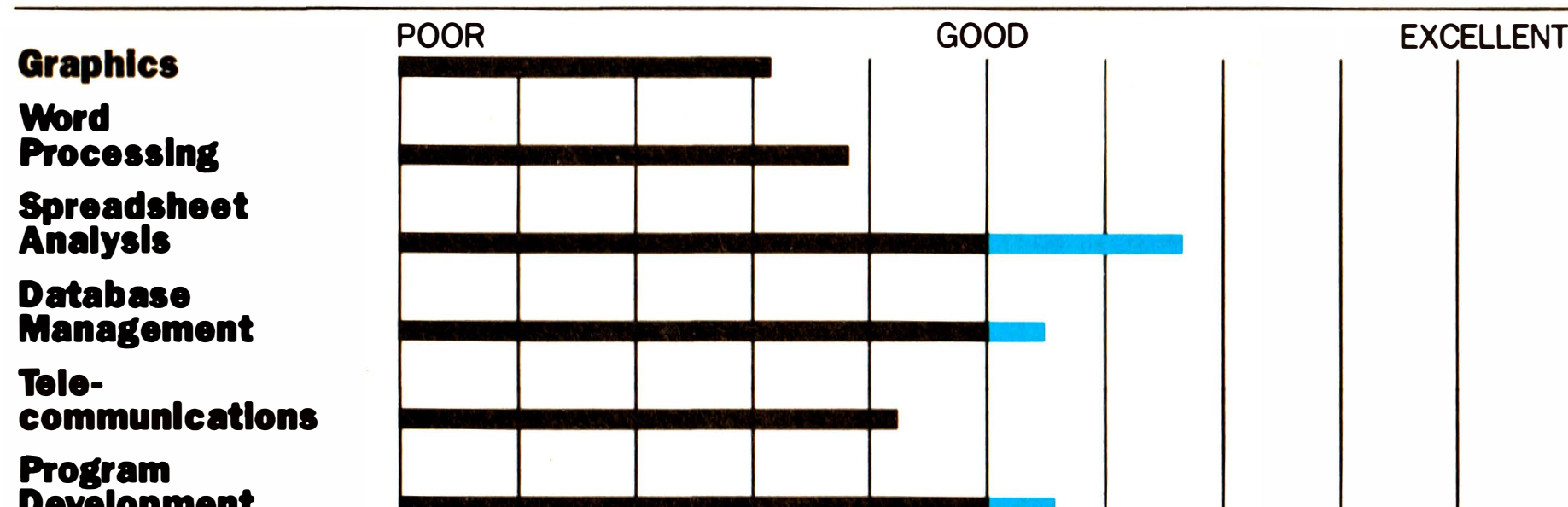
Certainly, the best way for a Macintosh owner to run IBM PC software is to buy another system.

—BARBARA ROBERTSON

Barbara Robertson, a journalist based in Mill Valley, California, was editor and research director of the *Whole Earth Software Catalog* 1.0 and 2.0.

AT A GLANCE

MacCharlie



Reviewer's Note: Although MacCharlie runs monochrome IBM PC programs on a Macintosh screen and transfers files between Macintosh and MS-DOS programs with ease, it displays them slowly.

Manufacturer: Dayna Communications Inc., 50 South Main Street, Fifth Floor, Salt Lake City, UT, 84144; (801) 531-0600

Standard Features: 4.77-MHz Intel 8088 microprocessor; 640K bytes of RAM and 24K bytes of ROM; two 360K-byte 5¼-inch double-sided floppy-disk drives; 28-key keyboard (also uses the 58-key, 2-key rollover, software mapped Macintosh keyboard); two RS-422 serial ports (230.4K-baud maximum); RS-232 serial port (19.2K-baud maximum); uses the Macintosh 9-inch-diagonal high-resolution screen; MS-DOS 3.1, file transfer program, GWBASIC, Compatibility Software

Base List Price: \$1795

Options: 8087 coprocessor (\$199); expansion chassis (not yet released)

Having transferred clipboard notes without incident, I decided to try transferring entire files. To do this, you select the transfer option from the File menu. MacCharlie then prompts you for file names using a pop-up window. (You can eject and switch Macintosh disks via this window—a handy feature if you have only one disk drive.) File transfer is quick; an 8K-byte text file from a MacCharlie MS-DOS application to the Macintosh took only 15 seconds. Transferring files the other way is just as fast and straightforward; however, only ASCII files can be transferred or the system might crash.

When you want to switch from MacCharlie to a Macintosh application, you can keep MacCharlie “running,” that is, available in RAM. But

a printer buffer for the Macintosh. This means you can select one Macintosh document to be printed after another—to the limit of MacCharlie's RAM—without tying up the Macintosh. Using all of MacCharlie's 640K bytes of RAM, a 250-page document could be printing in the background while you run another application on the Macintosh.

The Missing Link?

Critics have long condemned the Macintosh for its lack of compatibility with the world of IBM PCs, and that criticism opened a window of opportunity for Dayna. Although an unusual system, MacCharlie is impressive in its ability to transfer files and cut and paste information between applications running under

READ ONLY



A review of the IBM Personal Computer Family. Vol. 2, No. 3



HARDWARE NEWS

A growing family of PC Printers.

Different jobs demand different printers. IBM has developed a full line of printers for its Personal Computer Family to answer those demands. Two of the most recent—the IBM Proprinter and the IBM Color Jetprinter—deserve special mention.

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The IBM Proprinter.

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printing tasks like first drafts of letters or reports.

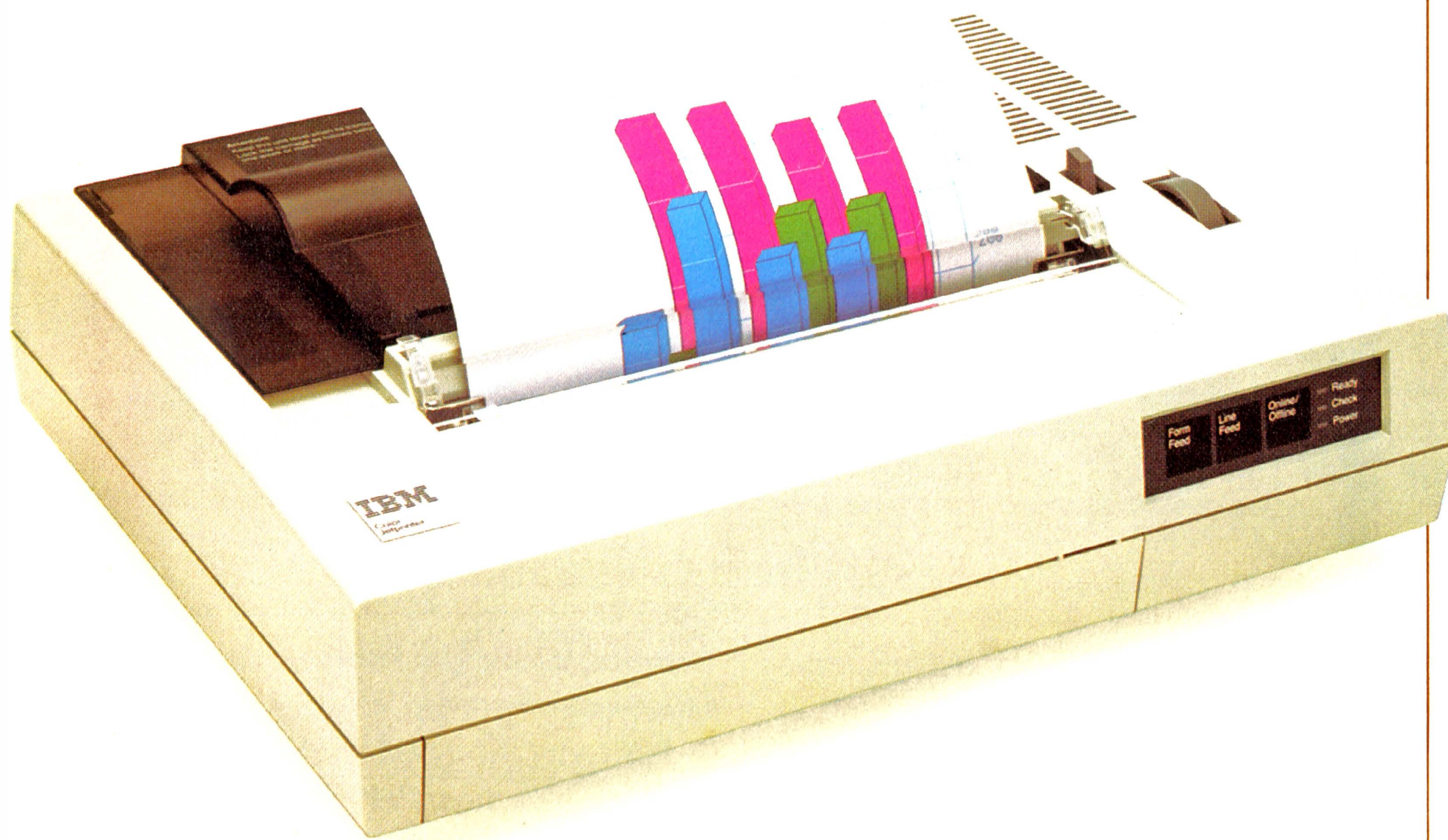
For more finished work, the Proprinter does near-letter-quality printing (at 40 cps) and lets you add emphasis to your text (at 100 cps) with bold print, condensed print and underlining.

It also has all-points-addressable graphics capabilities that can help you produce a complete range of charts and graphs to illustrate your text.

One additional plus: it's very competitively priced.



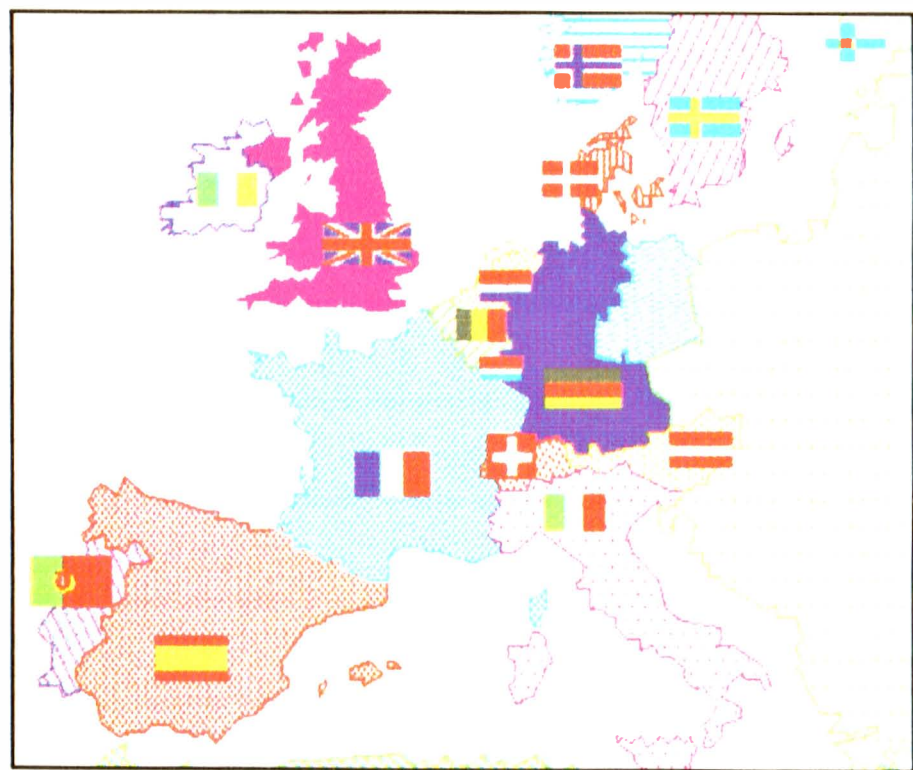
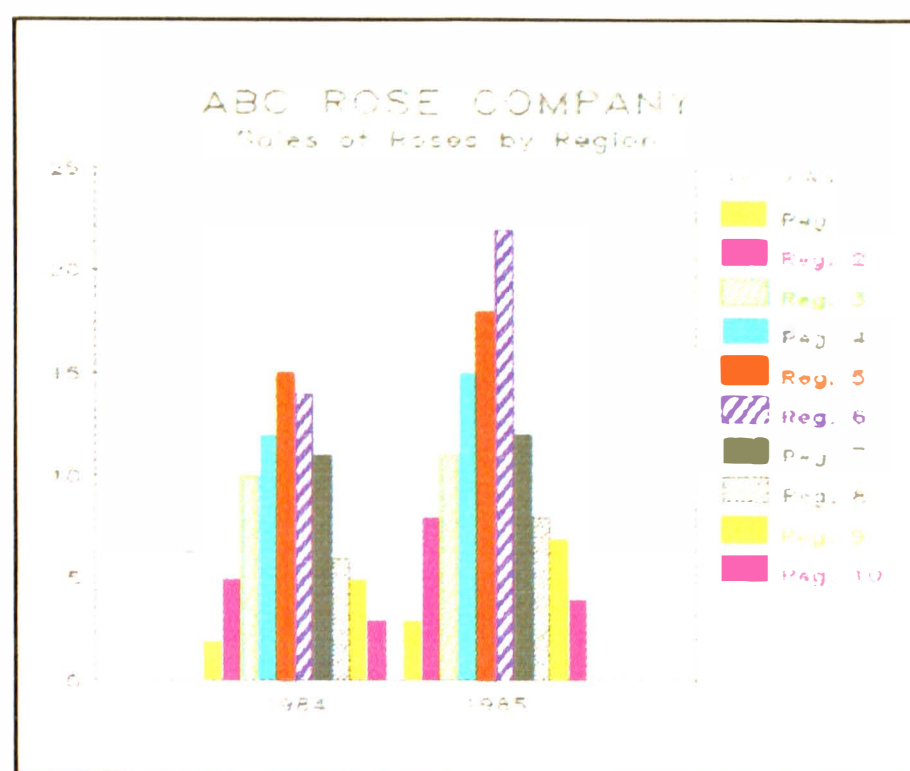
IBM Proprinter has a convenient slot for printing envelopes or single pages.



IBM Color Jetprinter quietly utilizes "drop-on-demand" ink jet technology.

The IBM Color Jetprinter.

The IBM Color Jetprinter is an unusually quiet, compact workstation printer that utilizes advanced "drop-on-demand" ink jet technology.



Samples of color graphics and texts produced by IBM Color Jetprinter.

Designed to be used with the IBM PC and many other personal computers, it's supported by a wide selection of software programs.

You can use it to produce draft and near-letter-quality text and high-quality graphics in up to seven colors.

In addition, the Jetprinter allows you to highlight your text with bold and underlined passages done in color or printed against a background color.

The Color Jetprinter also prints graphs, charts, engineering drawings and texts directly onto special Jetprinter transparencies for presentations.

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And if you need more than information retrieval, PC Videotex, in certain configurations, can be used to support your own Videotex data base.

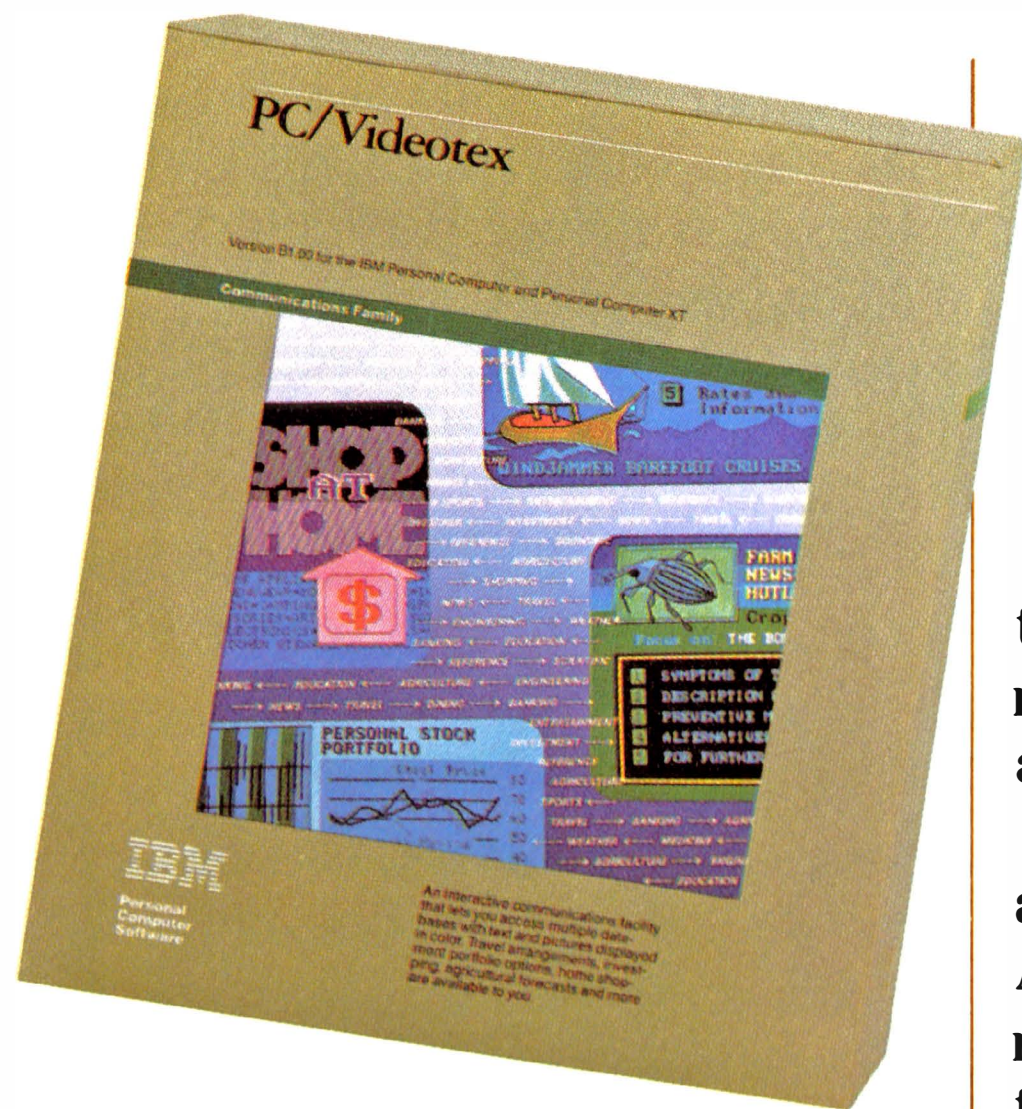


WHAT'S THE PROGRAM?

Create your own presentations.

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PC Storyboard's four modules—Picture Taker, Picture Maker, Story Editor and Story Teller—make it fast, easy and comparatively inexpensive to create, combine and modify pictures and stories. There's even an animation function that makes it possible for birds to fly, ships to move across water, words to become bigger.



IBM PC Videotex software makes Videotex connections in high-resolution color graphics and text.

Picture Taker lets you store the contents of screen displays from software you regularly work with, such as spreadsheet, business graphics, drawing or word processing programs.

You can use the Picture Maker module to edit and combine the graphics you've saved. Picture Maker also allows you to create completely new pictures containing both text—in a variety of type styles—and graphic figures.

Story Editor helps you organize and edit your pictures into a presentation and add various special effects. The results can be dramatic.

You can then use the Story Teller module to display the results on an IBM PC Color Display, on a TV or with a video projector.

The finished presentation can be copied on diskettes for distribution. You can also produce printed copies with a graphics printer like the IBM Color Jetprinter reviewed in this issue of *Read Only*.

After that, all you need is a director's chair from which to view the finished product.

Expand capabilities with IBM Planning Assistant Solutions, IBM Document Retrieval Assistant and PC Storyboard software.

Information at your fingertips.

A few months ago in this space, we reviewed Office Correspondence Retrieval System (OCRS) software from IBM, which provides a convenient way to keep track of information that otherwise might be filed and never found again.

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Like the original OCRS software, IBM Document Retrieval Assistant makes life much easier for anyone who stores large amounts of information on a fixed disk or who has a library of documents, memos or files stored on diskettes.

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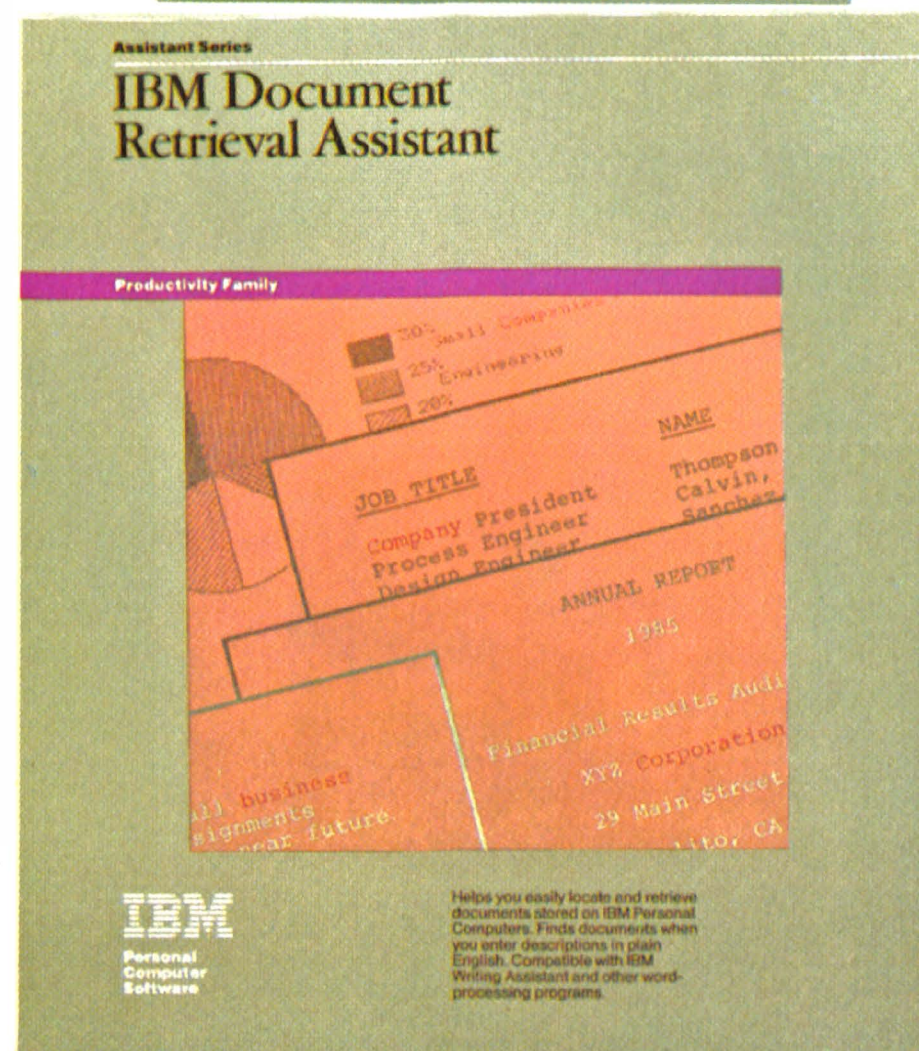
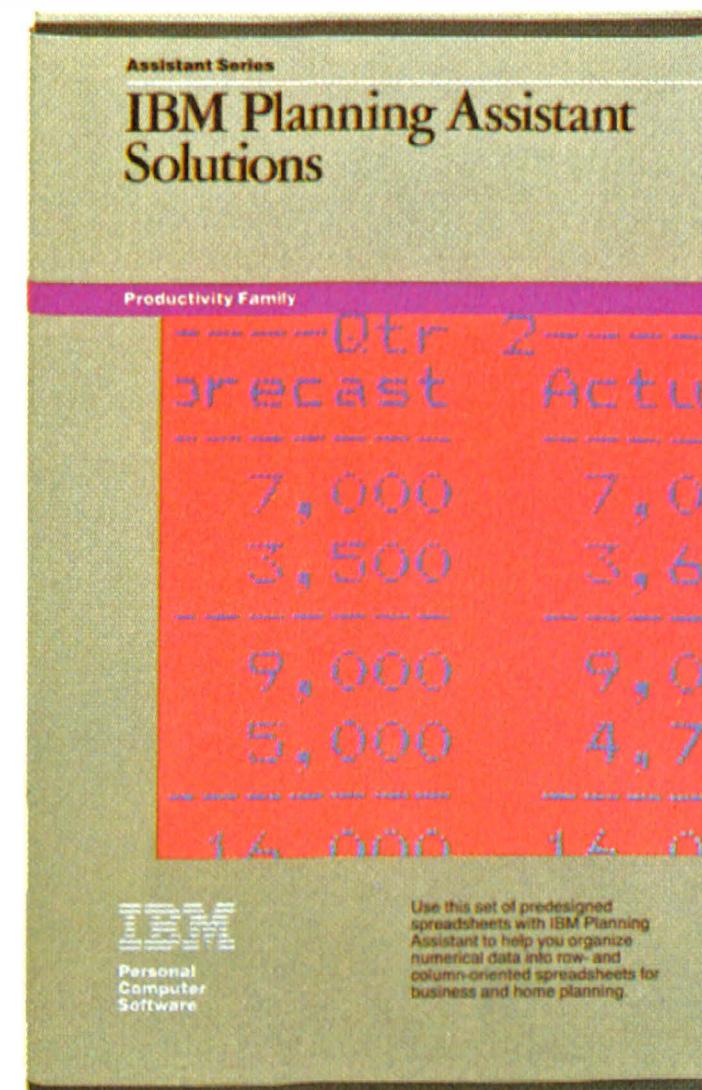
Among other popular word processing software, Document Retrieval Assistant works with IBM Writing Assistant, IBM PCWriter, the IBM DisplayWrite Series, and WordStar® (version 3.10 or higher).

WordStar is a registered trademark of MicroPro International Corporation.



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IBM BASIC Compiler 2.00 updates an indispensable business programming tool.

tion on simply designed spreadsheets. Your IBM Personal Computer does the hard part.

Planning Assistant Solutions includes spreadsheets like Loan Calculation and Real Estate Analysis for home use. Others, like Travel Expense Form and Financial Statement Worksheet, can help you sort out your business finances.

Many of the spreadsheets can use information from files you've created with IBM Filing Assistant. You can also include the results of your Planning Assistant Solutions work in IBM Writing Assistant documents and present them graphically with IBM Graphing Assistant.

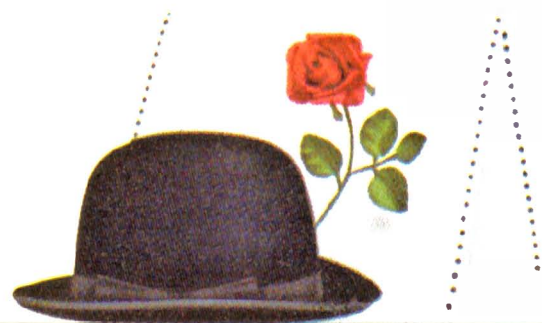
BASIC improvements.

It's good to know that in a business based on technological advances, the basics aren't forgotten.

The IBM BASIC Compiler 2.00 gives exactly that reassurance. It's an improved version of an indispensable business programming tool for the entire Family of IBM Personal Computers.

Among many significant improvements, the most recent version of IBM's BASIC Compiler includes better program control structures, allows you to compile larger programs and supports larger arrays. It also supports the IBM PC Network environment, provides better access to your IBM Disk Operating System (DOS), runs under TopView, and offers expanded graphics capabilities.

And there's a trade-up offer for current licensees that represents a significant savings on the IBM BASIC Compiler 2.00. See your Authorized IBM Personal Computer Dealer or IBM Product Center for details.



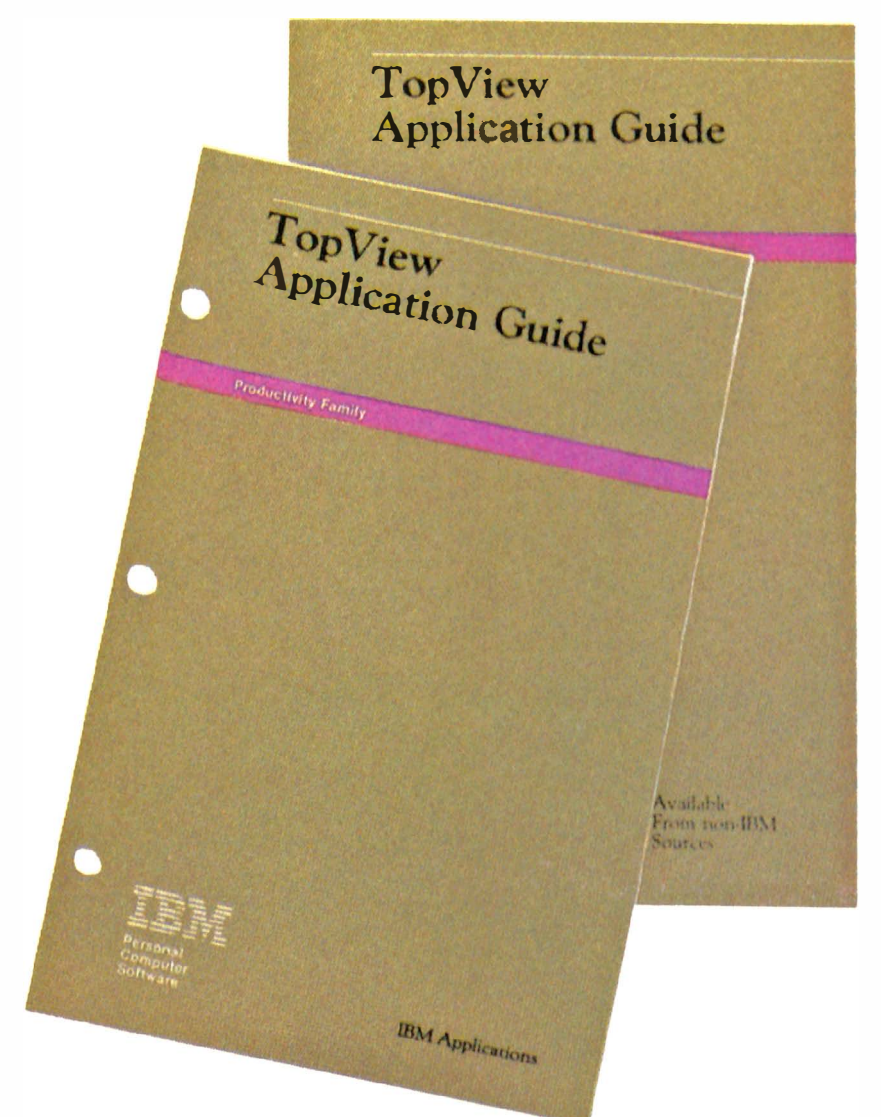
HARDCOPY

Guides to the top.

IBM TopView™ is a program that allows you to run more than one program at a time (multitasking) and to view screens from more than one

program on your display (windowing). This, in turn, makes fast work of switching back and forth among programs that you use frequently—word processing, filing and spreadsheet applications, for example.

The TopView Application Guides shown below are now included when you purchase a TopView program. They're useful listings of the many programs—IBM applications and software from non-IBM sources—that can be used with TopView. Both are arranged alphabetically and include special operating considerations and notes whenever necessary.



TopView Application Guides now included with the program.

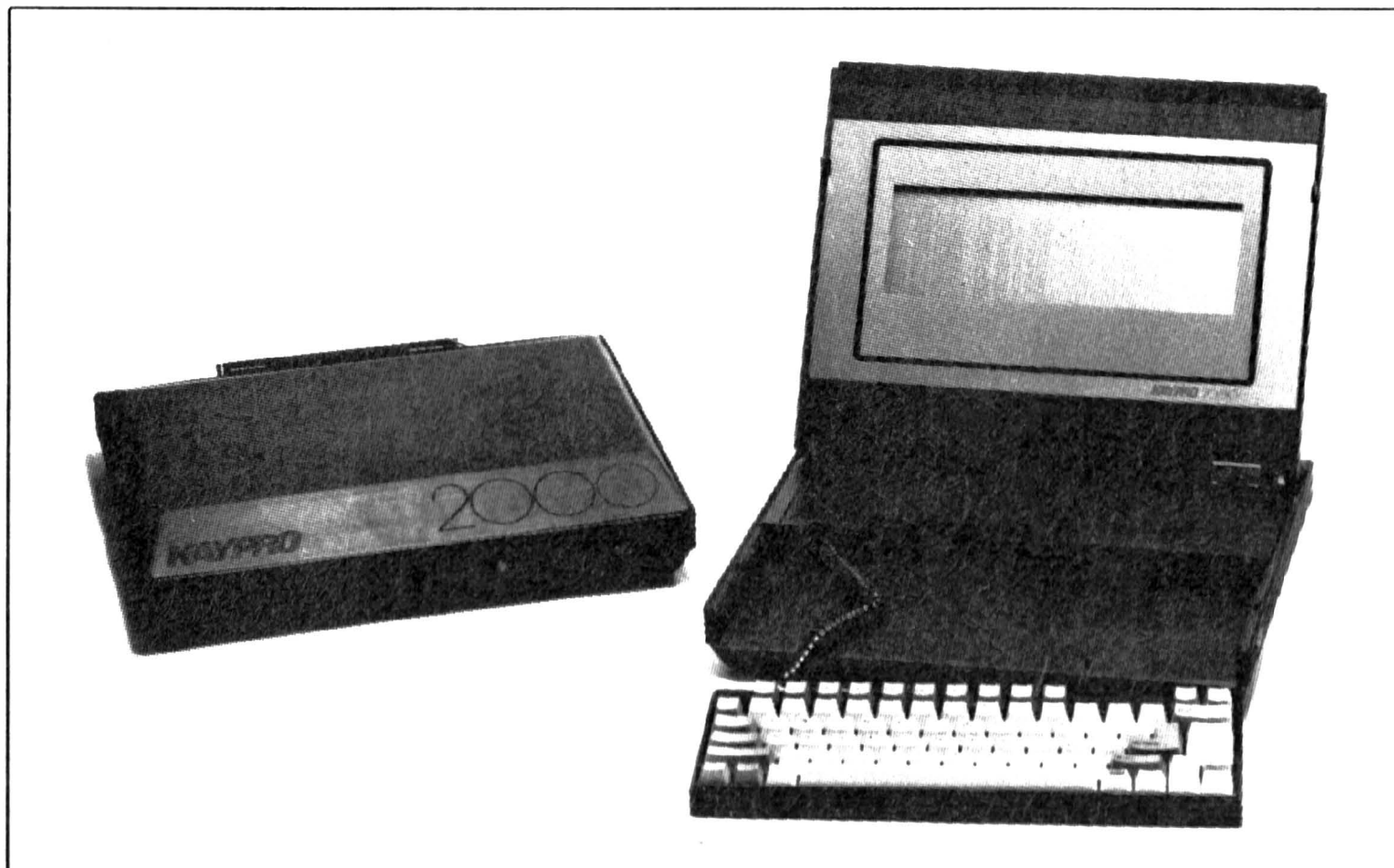
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The Kaypro 2000

*This versatile portable computer can double
as a desktop system*

The Kaypro 2000 is a strong contender in the laptop computer marketplace, where the "right stuff" means freedom from being tethered to an electrical outlet, compatibility with lots of software, and a screen display that doesn't make you wonder if your eyes are going bad. Its detachable keyboard, a feature missing from most portables, lets you move the computer around to get optimum visibility with its LCD. The Kaypro gets another boost from well-planned, inexpensive accessories that accommodate a standard monitor and IBM peripherals when you're not on the road.

With its 8088 microprocessor and built-in 3½-inch 720K-byte disk drive, the Kaypro 2000 is MS-DOS compatible. It won't accept off-the-shelf IBM PC software (on 5¼-inch disks), although it will run packages written for the Data General One, a rival laptop. Kaypro addresses this problem by including all the software most people need to begin computing. One disk contains MS-DOS, GWBASIC, Mite (a telecommunications program), and desktop utilities such as a calendar, date book, and calculator. A second disk has Word-

Star with MailMerge and an expense-management program.

Clever accessories offer further compensation. You can install a card-and-cable combination (\$95) in your IBM PC and use its disk drive to load programs into the 2000. If you don't have a PC, you can purchase a 5¼-inch disk drive (\$295) and a multiadapter (\$155) that has ports for a second 3½-inch drive, a parallel printer, and a standard RGB video controller card. A more powerful base unit (\$795) that also connects to the 2000 comes with an internal 5¼-inch drive, a second serial port, a parallel port, two IBM-compatible expansion slots, and room for another floppy drive or a hard disk. Video and floppy-disk controllers are built in; for a color monitor or hard disk you'll need additional controller cards for the base unit's two slots. Other accessories include an automobile power adapter (\$45), a lightweight spare battery pack that allows 4 to 8 hours of additional operation between recharges (\$25), a serial-to-parallel printer interface and cable (\$65), and a matching telephone (\$45) that snaps on beside the keyboard and dials from the modem or its own keypad.

The 2000 is an attractive computer, with a charcoal-colored aluminum case that makes the usual plastic laptop look like a toy by comparison. It's about the same size as other laptops (11½ by 13 by 2½ inches). It's heavy, though. At 11½ pounds, it weighs much more than most laptops. You can carry the 2000 with the handle that folds out from the back or in the black nylon shoulder bag that comes with the computer. The system operates on batteries for about 3 hours assuming infrequent disk-drive operation.

The liquid crystal screen displays twenty-five 80-column lines and offers IBM PC-compatible bit-mapped graphics at 640 by 200 pixels. The easy-to-read character font and adjustable contrast and viewing angle enhance the LCD's visibility.

Because the 77-key keyboard snaps out of the case, you can move both it and the display to the most comfortable operating position. Ten function keys are in a row above the number keys. The NumberLock key turns 11 clearly-marked number and letter keys into a calculator-style keypad that works with the bundled Polywindows Desk calculator. Unfortunately, the keypad doesn't work at all with most other programs. You must use the numbers at the top of the keyboard for spreadsheets and other software. Four cursor keys double as Home, End, PgUp, and PgDn when you press an adjoining blue-topped function key. The Insert and Delete keys are on the right side beyond the enter key, where you're not likely to strike them accidentally.

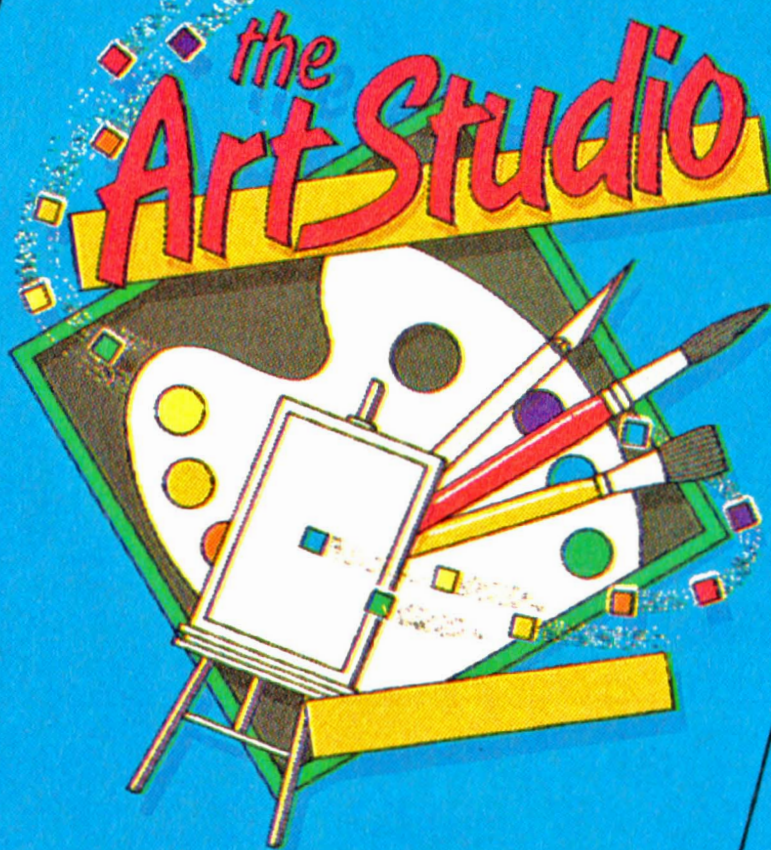
Resident memory is 256K bytes (a 768K-byte version of the 2000 is also available). The RAM-disk software that's included makes maximum use of the extra memory. A built-in asynchronous serial port accepts a printer or external modem. Two standard telephone jacks are for the optional internal modem, a 300/1200-baud Hayes-compatible unit that Kaypro sells for a reasonable \$295. A 100-pin connector on the bottom lets you snap the 2000 without cables to the disk-drive adapter or base unit.

Software

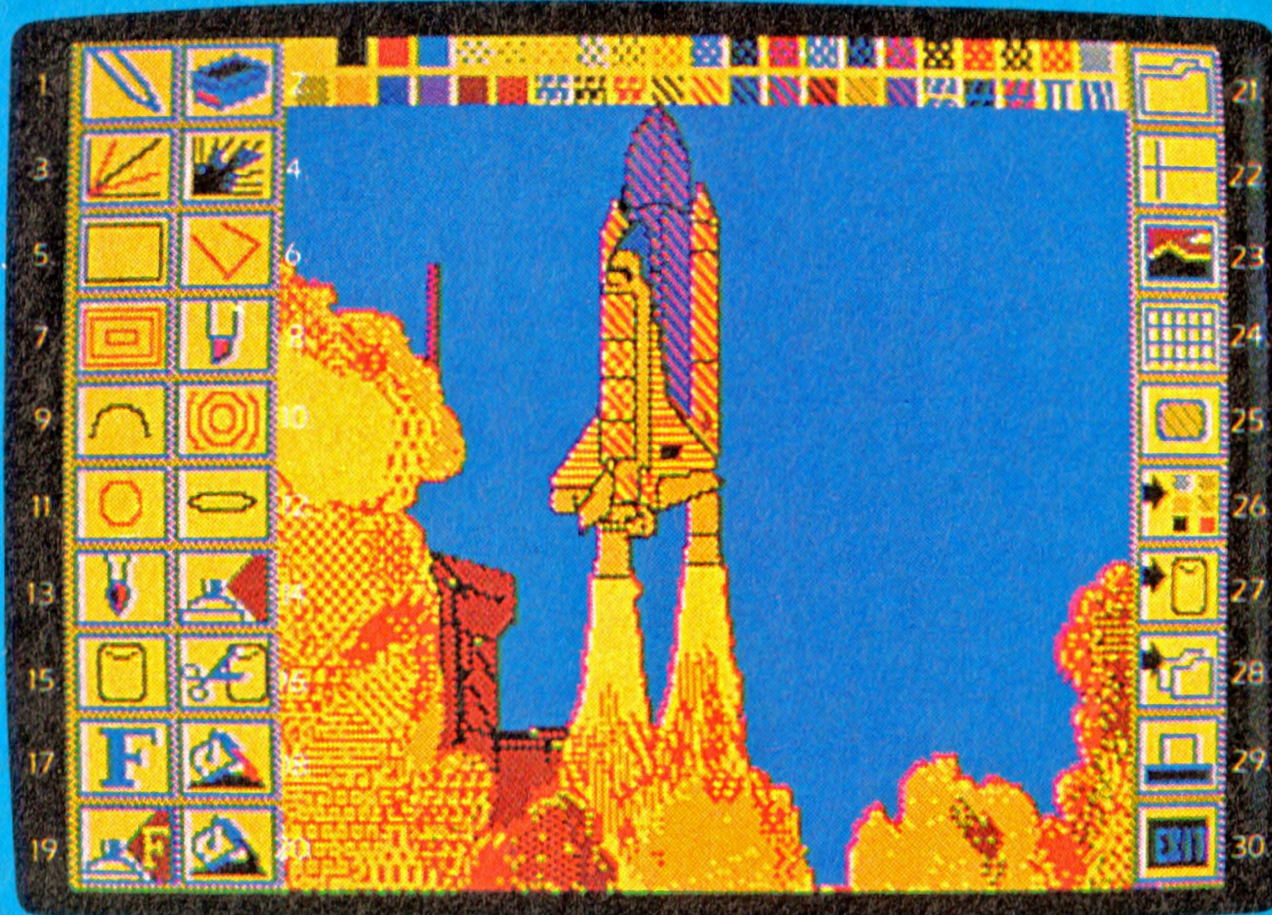
The software that's bundled with the 2000 varies in its usefulness.

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Circles
11. Circle
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13. Custom
Brush
14. Airbrush
15. Clipboard



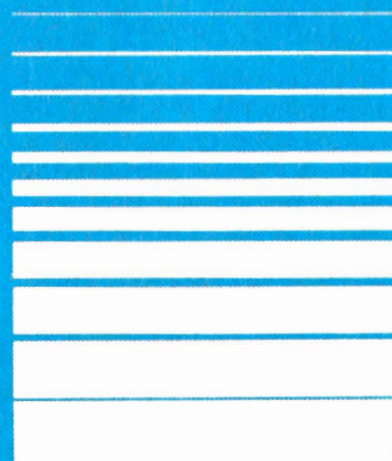
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18. Swap Fill
19. Brush
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POPULAR REVIEWS HARDWARE

Although WordStar and MailMerge are included, many users would be better served by a less powerful but easier-to-manage word processor. Mite, for communications, is another powerful program that's not particularly friendly.

The Traveling Expense Manager is more interesting and lets you track everything from auto mileage to checking-account activity. Expense Manager is easier to learn and use than WordStar and Mite; you select the commands from menus and enter them with the function keys. You can designate up to five funds, such as checking, cash, and credit cards, and several dozen expense categories. If you're reimbursed for some expenses, you can designate part or all of a transaction as billable. Later you can print out seven kinds of expense summaries based on the information you've entered. At the end of each fiscal period you can close accounts and either forward or discard balances. Utility commands let you organize files for efficient use of disk space and minimum access time.

Polywindows Desk

An especially thoughtful addition to the software bundle is Polywindows Desk, an accessory program you can invoke at any time without exiting what you're currently running (see page 122, August 1985 issue). Included are a calendar, date book, macros for your applications programs, an auto-dialer, note pad, calculator, and simple data manager. You can move text from one application to another and perform some routine DOS functions, such as checking the remaining disk space and changing your hard-disk directory. You can't format disks from within an application, but you can erase or rename files. Polywindows uses a lot of memory—as much as 150K bytes if all data files are included. If your application needs more memory, you can load just the datebook, the calendar, and note pad.

Documentation

Documentation is the 2000's weakest point. The 50-page User's Guide tells you how to set up the machine and make working copies of the en-

closed disks and gives a brief introduction to the keyboard. There's no further discussion of the software, and some of the other manuals make you wonder if you've got the right programs. The WordStar and Mite guides appear to be the same manuals Kaypro distributes with its CP/M machines; they offer no hints as to how the programs should behave on the MS-DOS-based Kaypro 2000. The Expense Manager and PolyWindows Desk guides are exceptions—they do a good job of explaining what the programs do and how to use them. The MS-DOS and BASIC manuals are standard Microsoft fare—they present commands and functions alphabetically in a reference format.

Checking It Out

The 2000 is extremely easy to set up—just open the lid, insert a disk, and you're off. The disks that come with the computer automatically walk you through the process of making working copies. But making backups with the single drive is time-consuming, involves quite a bit of disk swapping, and doesn't seem to take advantage of the computer's extra memory. The batteries hold up well under normal use; a charge lasts for about two weeks on the shelf and you can leave the computer plugged in to maintain the battery. Most laptop computers offer some kind of interface with menus and function keys for communicating with the operating system. Not so the 2000; it leaves you staring blankly at the A> prompt after you've backed up the software. If you're already using a PC at work, however, you'll feel right at home.

Programs behave on the 2000 just as they do on other MS-DOS computers. In simple speed tests, the 2000 was slightly faster on memory operations and slightly slower on disk accessing than an IBM PC. With the optional 5¼-inch disk drive, the 2000 can run Lotus's 1-2-3, Microsoft Flight Simulator, and other software standards with no problem.

Should You Buy It?

Although many laptop computers cost under \$1000, the Kaypro's \$1995

price tag seems reasonable for its features. It offers fast, built-in storage, lots of memory, a powerful microprocessor, and an adequate selection of bundled software. Its display is as readable as any 80 by 25 LCD screen on the market, and the detachable keyboard is a definite plus. The 2000's high degree of expandability is another plus.

extras, a less-expensive laptop might be a better buy. One more important consideration: manufacturers of portables are fond of touting their products as the equals of desktop computers, and Kaypro is no different. However, in the case of an expanded 2000, the claim is more than just hype. If you add the base unit, modem, video

AT A GLANCE

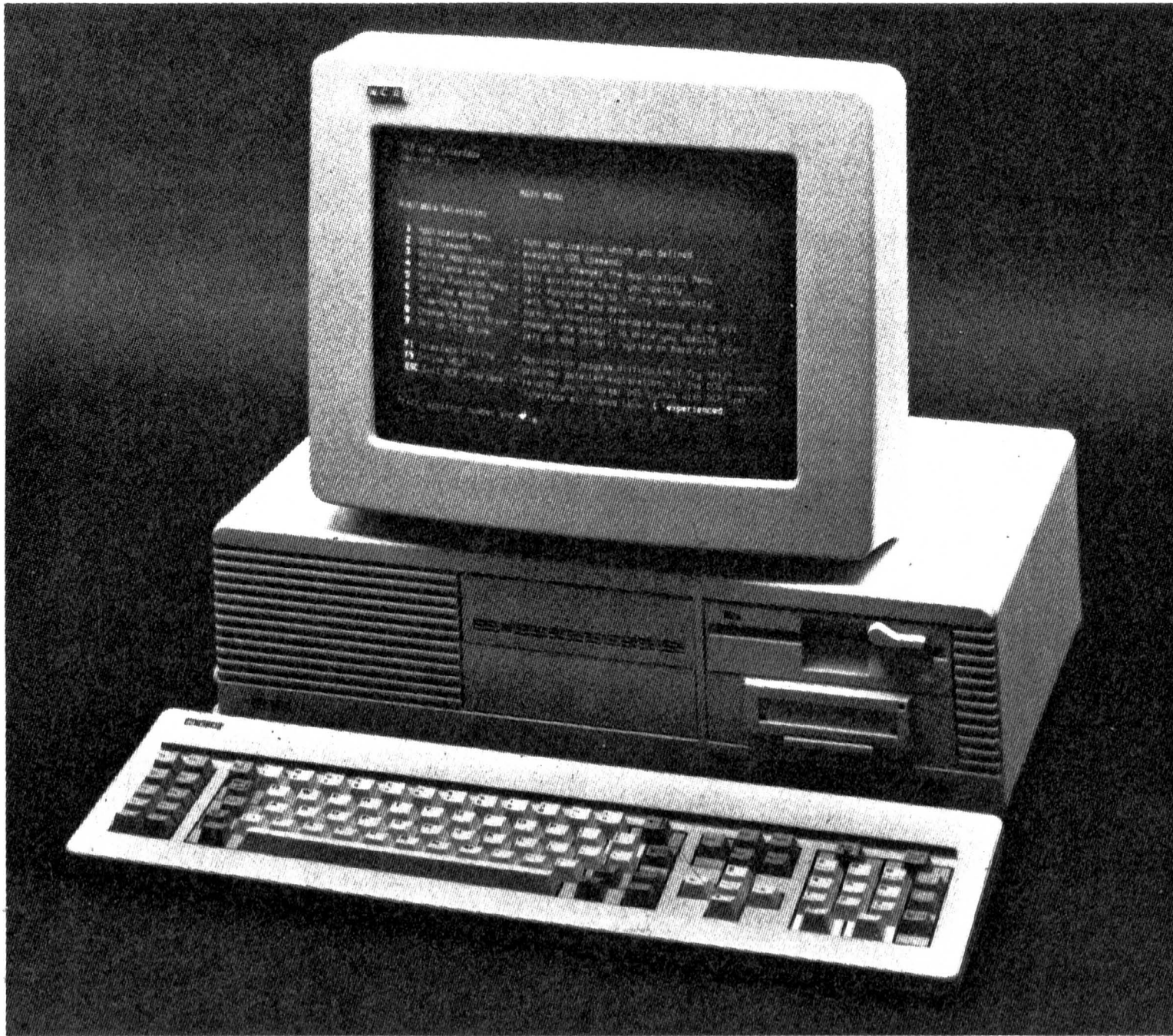
The Kaypro 2000

	POOR					GOOD					EXCELLENT
Graphics											
Word Processing											
Spreadsheet Analysis											
Database Management											
Telecommunications											
Program Development											
Reviewer's Note:	A good combination of power, price, and expandability allow the Kaypro 2000 to perform as both a laptop and a desktop system. But difficult documentation and lack of a simple user interface make this computer a poor choice for beginners.										
Manufacturer:	Kaypro Corp., POB N, Del Mar, CA 92014, (619) 481-4300										
Standard Features:	4.77 MHz 8088 microprocessor; 256K bytes of RAM; 720K-byte 3½-inch disk drive, 80-column by 25-line LCD; RS-232 serial port; battery pack; charger; carrying case; bundled software includes word processing, desk accessories, expense management, GWBASIC, and MS-DOS 2.11										
Dimensions:	11½ by 13 by 2½ inches; weight: 11½ lbs.										
Base List Price:	\$1995; with 768K bytes of RAM, \$2195										
Options:	Base unit with two IBM PC-compatible expansion slots, 5¼-inch floppy-disk drive, space and connectors for additional floppy drive or hard disk, RS-232 serial port, parallel printer port (\$795); multiadapter with connectors for 5¼- and 3½-inch disk drives, parallel printer port, video card slot (\$155); PC card and cable that allows the 2000 to use the PC's disk drives (\$95); additional 3½- or 5¼-inch floppy drives (\$295 each); serial-to-parallel conversion interface (\$65); 300/1200-baud Hayes-compatible internal modem (\$295); modular telephone attachment (\$45); spare external battery pack (\$25); automobile power adapter (\$45)										

On the negative side is the lack of a built-in modem and easy-to-use MS-DOS interface, as well as its extra weight and sketchy documentation. Also, you could have problems if you need a wide variety of software. The nonstandard drive in the unexpanded 2000 leaves you stranded with the original bundle—at least for now. If you're familiar with computing and want a full-featured portable, the 2000 is still high on the list of best choices. If you're a novice or if you don't require too many fancy

controller, and a monitor, you have a viable desktop system for about \$3535. (Adding just the modem, external floppy drive, adapter, and monitor would reduce this to about \$3190.) A standard IBM PC and monitor plus a typical laptop will cost about \$3700. The Kaypro 2000 could in fact economically perform both functions for many users. —TAN A. SUMMERS

Tan A. Summers frequently reviews hardware for *Popular Computing* and is the author of *The Small Business Guidebook to PC Compatibles* (Scott, Foresman).



The NCR PC6

This easier-to-use alternative to the IBM PC comes from a company experienced in supporting the business community

AT A GLANCE

The NCR PC6

	POOR	GOOD	EXCELLENT
Graphics			
Word Processing			
Spreadsheet Analysis			
Database Management			
Telecommunications			
Program Development			

Reviewer's Note: Ease of use is this computer's greatest asset. Performance is slightly better than that of the IBM PC and the price is reasonable.

Manufacturer: NCR Corp., PC Division, PCD-1, Main & Caldwell Sts., Dayton, OH 45479; 800-544-3333

Standard Features: (Model 1012): Intel 8088-2 dual-speed processor (4.77/8.00 MHz); 256K bytes of RAM, expandable to 640K bytes on main board; detachable keyboard with separate cursor control and numeric keypad areas, LED indicators on Caps and Num Lock keys; two 360K-byte floppy-disk drives; eight expansion slots; integrated RS-232 and Centronics-compatible parallel printer ports

Base List Price: \$2585

Options: 20-megabyte hard disk (\$1545); 10-megabyte tape backup (\$1050); 256K-byte RAM upgrade (\$495); standard monochrome monitor and video card (\$520); high-resolution (640 by 400) graphics displays: monochrome with 32K-byte adapter board (\$849), color with 64K-byte adapter board (\$1260); tilt-and-swivel display stand (\$65)

The NCR PC6 is more than just another IBM PC clone.

Like other NCR personal computers, the PC6 comes with manuals and software that truly make the system easy to use. And it's based on a relatively new processor—the Intel 8088-2, which is compatible with the IBM PC's 8088. The 8088-2 lets you run applications at either of two internal clock speeds: at the IBM PC-standard 4.77 MHz or, at the touch of a button, in an extra-performance mode (called the XP mode) at an internal clock rate of 8 MHz.

The PC6 comes with 256K bytes of RAM, which can be expanded to 640K simply by adding chips on the main circuit board. The case has room for four half-height 5¼-inch disk drives. A basic system that sells for \$2585 includes two 360K-byte floppy-disk drives and ports for a Centronics-compatible parallel printer and an RS-232 serial device. The system is also available with a 20-megabyte hard disk and a 10-megabyte tape backup unit.

Eight expansion slots, six full-length and two for so-called short boards, accept standard IBM PC-compatible option boards. The floppy-disk controller and the circuitry for the parallel and serial ports are included on the computer's main board, so most of the slots are available for your customization. Like the IBM PC, the video and hard-drive adapters require slots. Also, a special board that provides the necessary programming for changing the 8088's speed requires another slot. NCR says that board will soon be replaced by a new ROM chip that plugs into a socket on the main board.

The keyboard uses the standard IBM key positions for the programmable-function and alphanumeric keys but provides cursor-control keys separate from the calculator-style keypad. Number Lock and Caps Lock keys have indicator lights that really work, unlike those on some keyboards where pressing Ctrl plus a lighted key may turn off the light without changing the key status.

A display is not included in the purchase price, but NCR offers a choice of three monitor and adapter

combinations. One is an IBM-standard monochrome monitor with a resolution of 640 by 200 pixels. More impressive are NCR's two high-resolution monitors, one a green monochrome and the other RGB color. Both provide resolution of 640 by 400. The color monitor displays 16 colors and comes with a 64K-byte graphics card. The monochrome monitor produces 16 shades of green and comes with a 32K-byte graphics card.

Documentation and Software

The PC6 has inherited the PC4's fine set of tutorials and other aids, both in printed and program form. The accompanying disk introduces new users to keyboards, peripherals, and other facets of computing.

The BASIC manual contains many more examples than the IBM PC's BASIC manual and includes exercises with detailed explanations of the commands and techniques used. In addition to two permanently write-protected disks containing the operating system, BASIC, and utility programs, the PC6 includes a disk-based tutorial that helps reinforce concepts introduced in the DOS manual.

When the computer is first booted, a batch file on the DOS disk walks you through the creation of backup disks, then introduces you to a menu-driven MS-DOS shell. A menu lets you create your own secondary menu for application software and then select and run the programs you want. You can set the time and date, enable or disable a clock display at the top of the screen, or execute DOS commands from a sub-menu.

The shell offers three levels of assistance with DOS commands. At the novice level, prompts step you through the correct entry of parameters. The experienced level works just like ordinary DOS, although pressing a function key gives you access to the menu. In between is a help level that remains hidden until you make a mistake, then pops up with an example of the correct syntax for that command. At all levels, pressing a function key calls up a help screen specific to the DOS command in question. And to make

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All this friendliness may sound like a gimmick, but don't underestimate it. Countless owners of IBM PCs and less friendly workalikes remain ignorant of many facets of DOS just because using them means combing through 3 inches of hard-to-read documentation. With this system most people will be able to dig in and get most of the power DOS has to offer right from the start.

Using the PC6

The PC6's extra-performance mode is not quite as fast as that of the Compaq Deskpro, another souped-up IBM PC-compatible. In fact, in a BASIC test that performs repetitive mathematical computations, the PC6's slow mode was actually 10 percent slower than an IBM PC running the same test. In fast mode, the PC6 beat the IBM PC by about 30 percent.

In order to be considered operationally compatible, the highest level of compatibility, with the IBM PC, a computer should be able to accept software, peripherals, and expansion boards intended for the IBM PC. The PC6 does well on all counts. In my tests, the PC6 had no problem running either memory-resident programs or programs that provide their own operating environment, two kinds of software that usually trip up less compatible hardware. I tried IBM PC DOS 2.1, Microsoft's Flight Simulator, Borland's SideKick, and my own BASIC programs.

The built-in NCR tape drive for backing up hard-disk data comes with software that's quite complete when compared with stand-alone backup systems. It's slower than most stand-alones, however, performing a mirror-image backup of 10 megabytes in 19 minutes and a file-by-file backup in 40. Pre-backup formatting, necessary only the first time a tape is used, takes approximately half an hour. Backup of the 20-megabyte hard disk requires two tapes, with the software automatically dividing the backup into volumes. The backup software can be operated from menus and is easy to

use in comparison with many backup programs.

Where Does the PC6 Fit?

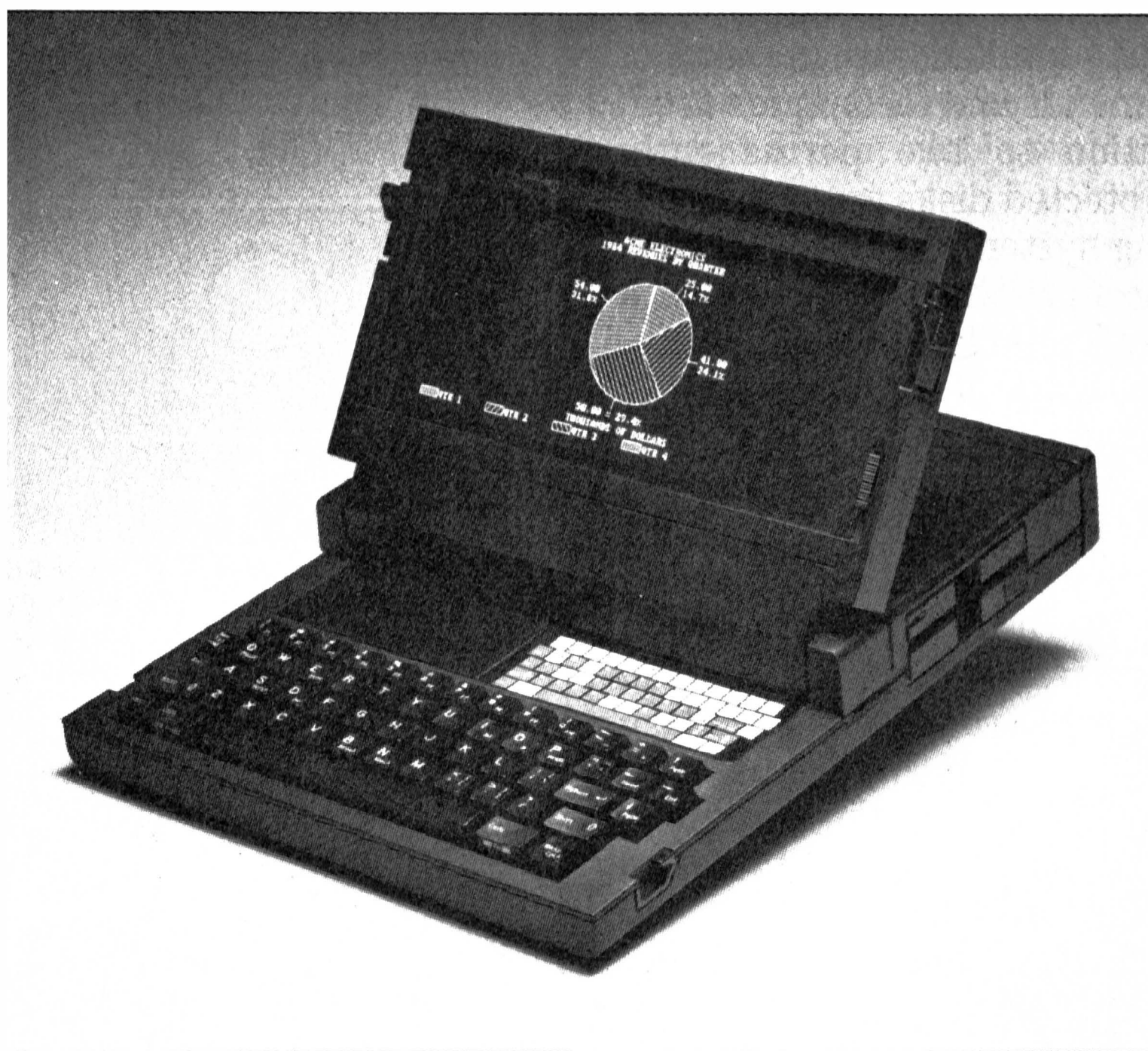
To achieve a high level of compatibility, NCR has had to imitate rather than innovate. But even though the PC6 doesn't offer earthshaking advances in microcomputer technology, it does offer a well-designed system. Placing the peripheral interfaces, controllers, and extra memory on the main circuit board leaves more slots available for networking, telecommunications, and other advanced uses than do most IBM PC workalikes. Little things like volume control for the speaker and a one-touch switch for the XP mode make computing more pleasant, too.

The price of the basic configuration is comparable to that of a

similarly equipped but slower IBM PC. In its high-end configuration with one floppy-disk drive, a 20-megabyte hard drive, a 10-megabyte tape drive, and 512K bytes of RAM, the PC6 costs about the same as its closest competitor, the Compaq Deskpro. However, considering its easy-to-use operating shell, tutorial disks, and excellent documentation, NCR's machine compares quite well to the Compaq Deskpro. And I would recommend it over the IBM PC for business environments where IBM PC compatibility is an important factor—especially if those who will be using it are inexperienced.

—TAN A. SUMMERS

Tan A. Summers frequently reviews hardware for *Popular Computing* and is the author of *The Small Business Guidebook to PC Compatibles* published by Scott, Foresman.



The GridCase

*Grid's new portable offers IBM compatibility
and a choice of flat-panel displays*

Grid Systems has been the black sheep of portable computing since it brought out its expensive Compass computer three years ago. Truly a state-of-the-

art computer, the Compass featured an electroluminescent display, bubble memory, and a proprietary operating system. Unfortunately for Grid, high tech and high prices have

not added up to high-volume sales. The Compass raised many eyebrows but didn't open many billfolds.

Even though the Compass never captured a diverse audience, Grid sold it successfully in specialized markets, most notably to the government. Indeed, instead of laying claims on a retail market, the company used a direct-sales approach designed to woo buyers.

But last spring the announcement of the GridCase line of computers marked a significant change in the company's philosophy. It should come as no surprise that Grid's new doctrine was influenced substantially by IBM. In fact, a marketing brochure promoting the GridCase asks the question: "What's black and red and blue all over?" Like the Compass, the GridCase's exterior is black. One of its three available flat-panel displays is red, and when you turn the computer on, it can run software developed for Big Blue.

However, the GridCase isn't the first portable that's IBM compatible. The Data General One, the GridCase's closest competitor, has some of the same features, including an LCD that is not suitable for long-term use.

The GridCase is a 12-pound computer that comes with a built-in display, a 3½-inch micro-floppy drive that holds 720K bytes of data, optional amounts of up to 512K bytes of CMOS RAM, four ROM sockets that can hold programs on plug-in chips (up to 512K bytes), and a 57-key keyboard.

Three to Go

Three models of the GridCase are available, each with a bit-mapped flat-panel screen that displays 80 characters by 25 lines and 640 by 200 pixels. Gone are the electroluminescent display and bubble memory, which has been displaced by the disk drives and ROM slots.

The GridCase can be connected to a standard AC power outlet or an optional internal battery pack. (The battery pack will run a GridCase with an LCD for up to 5 hours.) Other options for the unit include a second 3½-inch disk drive, a 360K-byte 5¼-inch drive, an external 10-megabyte hard disk, an internal 1200/300-baud modem, an 8087 co-

processor, and a base station battery charger and power supply that link several peripherals together.

The GridCase 1 sells for \$2975 and comes with a black-on-gray LCD similar to those found on many other portable computers. In a well-lit room with the screen properly adjusted this display is readable but not ideal. Unlike some other flat panels, this one scrolls quickly without leaving behind the fading images of characters. However, this economy-model LCD panel is hard on your eyes, especially if you use the computer for hours at a time.

At \$3150, the GridCase 2 is worth the extra investment. Its "enhanced" LCD is easier to read, thanks to strong contrast between its dark blue characters and a background that can be adjusted from yellow to light blue.

Of course, light-reflecting LCDs will never satisfy everyone since they require constant adjustment depending on a room's lighting and can be easily read only if you are

directly in front of the screen. LCDs used for sales demonstrations or tutorials for several people are sure to cause annoyance. I didn't mind using the enhanced LCD on the GridCase 2 but was always relieved to get back to the high-resolution Macintosh or the amber screen on my IBM PC.

Gas-Plasma Display

The GridCase 3 gets around the whole problem of LCDs with its gas-plasma display, and its superior quality accounts for the system's hefty \$4350 price. This screen is the clearest flat-panel display I've used. Its contrasting red-on-black image is much more than the red-on-red plasma display offered by some other manufacturers. All three GridCase flat panels share one disturbing characteristic: they reflect light. When only part of the screen is filled with text you will see yourself and some of the background scenery in your office. But the GridCase 3 display also emits light and can be used without much concern for the room's

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illumination. Unfortunately, the gas-plasma display consumes a lot more power than either LCD panel. If you are running the GridCase 3 with its battery pack, you'll be out of power in about an hour.

There's another problem, too. The computer uses a small red light to warn you when the battery is running low. If you see this light, you have only a few minutes to save your data to disk. If you don't do it in that time, you could lose the data. The warning is not very conspicuous, and it should alert you earlier.

The GridCase unit has an optional interface that lets you use it with an IBM PC-compatible RGB monitor. This option could influence your choice of a flat panel. If you use the portable LCD infrequently, then you might be more inclined to pick a less expensive model.

Measuring 2¼ by 11½ by 15 inches, the computer has a much smaller footprint than an IBM PC or a Compaq portable. The display folds open, and its position is adjustable. However the adjusting leg on the rear panel of the computer is difficult to fold up. Not only does it take excessive force to shut the leg back into the case, but it closes with a violent finger-bruising snap.

The GridCase's internal 3½-inch disk drive works beautifully. It is extremely quiet and has an eject button on the side that simplifies disk removal. The drive is so quiet that if you cover the in-use light, you can't tell when the drive is working. Also, you can store twice as much information on one microfloppy disk as on a standard IBM PC disk. Information loads quickly, too. Disk read and write benchmarks on the GridCase were somewhat faster than on an IBM PC and nearly equal to PC AT speeds.

The keyboard—slightly different from the IBM PC's—has its control key in the lower left corner, parallel with the space bar, and the back space key in the lower right corner. Another difference that I found to be an annoyance is the need to depress two keys to turn on caps lock.

More troublesome is Grid's decision not to include separate function keys. You execute function-key commands by depressing one of the code

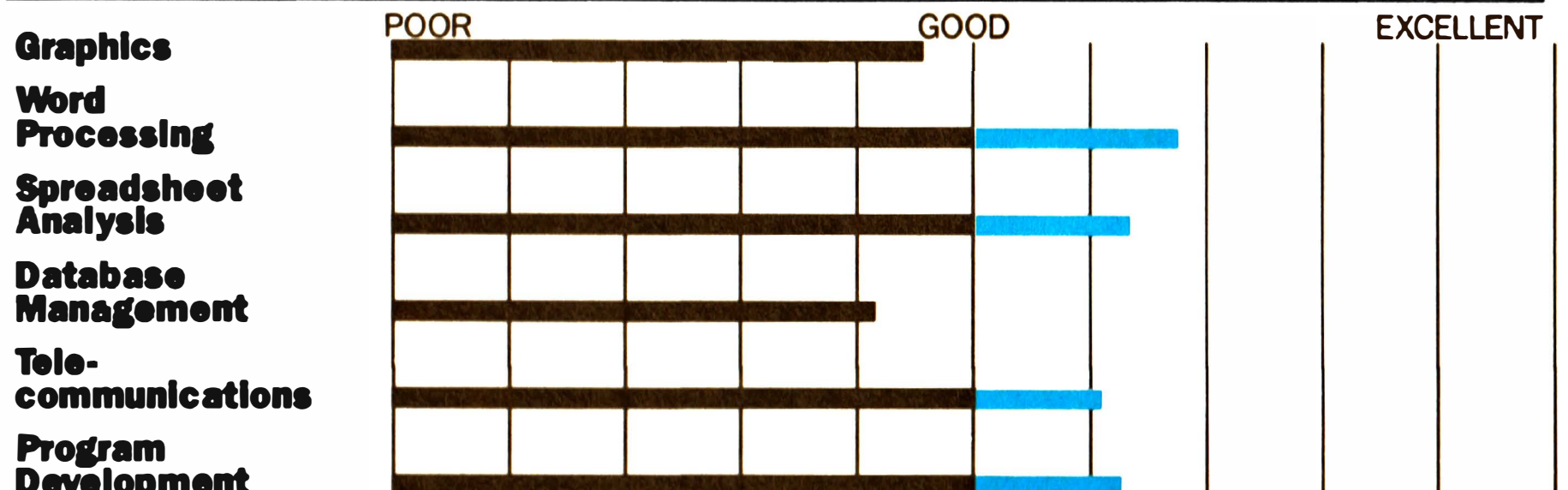
keys on either side of the space bar together with a number key. Nevertheless, you can take advantage of software that uses function keys. Diehard IBM PC users can plug their PC keyboards into the back of the GridCase and bypass Grid's keyboard completely.

share a common menu-oriented user interface. Once you've learned the commands for one program, you'll pick up the others quickly.

These programs as a group are called Grid Management Tools. They are available together on disk for \$790. You can also purchase Grid-

AT A GLANCE

The GridCase



Reviewer's Note:

The GridCase is a well-built, sturdy, and reliable portable computer that's compatible with the IBM PC. Although it is expensive and cannot take add-on expansion boards, it measures up well against its closest competitor, the Data General One.

Manufacturer:

Grid Systems Corp., 2535 Garcia Ave., Mountain View, CA 94043; (800) 222-GRID

Standard Features:

80C86 microprocessor (4.77 MHz); 128K bytes of CMOS RAM; capacity for four user-installable ROM chips (up to 512K bytes); 3½-inch floppy-disk drive that stores 720K bytes; 640 by 200 bit-mapped display; RS-232 serial interface; Centronics-compatible printer port; system I/O bus connector for peripherals and access to IBM PC-compatible expansion chassis; 57-key keyboard; color video output; 5-pin DIN plug for external keyboard (IBM PC-compatible); RJ-11 telephone jack; self-charging internal nickel-cadmium battery; built-in speaker; compatible with GridServer network system

Base List Price:

GridCase 1 with LCD: \$2975
GridCase 2 with enhanced LCD: \$3150
GridCase 3 with gas-plasma display: \$4350

Options:

Rechargeable internal battery pack (\$60); 8087 arithmetic coprocessor (\$195); internal RGB color video port (\$350); internal 1200/300-baud modem (\$795); 128K bytes of CMOS RAM (\$600); 384K bytes of CMOS RAM (\$1200); 3½-inch external disk drive (720K bytes capacity, \$895); 5¼-inch external disk drive (for IBM PC-compatible disks, \$895); 10-megabyte hard disk (\$2250); base station battery charger/power source (\$450); Grid-OS (\$5 on disk, \$300 on a ROM chip); software including Grid Management Tools (\$790); GridMaster desktop organizer (\$250); GridPaint (\$200); GridTask advanced application building language (\$250); GridTerm TTY terminal emulator (\$200); Grid3101 terminal emulator (\$250); GridVT100 terminal emulator (\$250); GridAccess (\$150); MS-DOS (\$150 on disk, \$300 on a ROM chip)

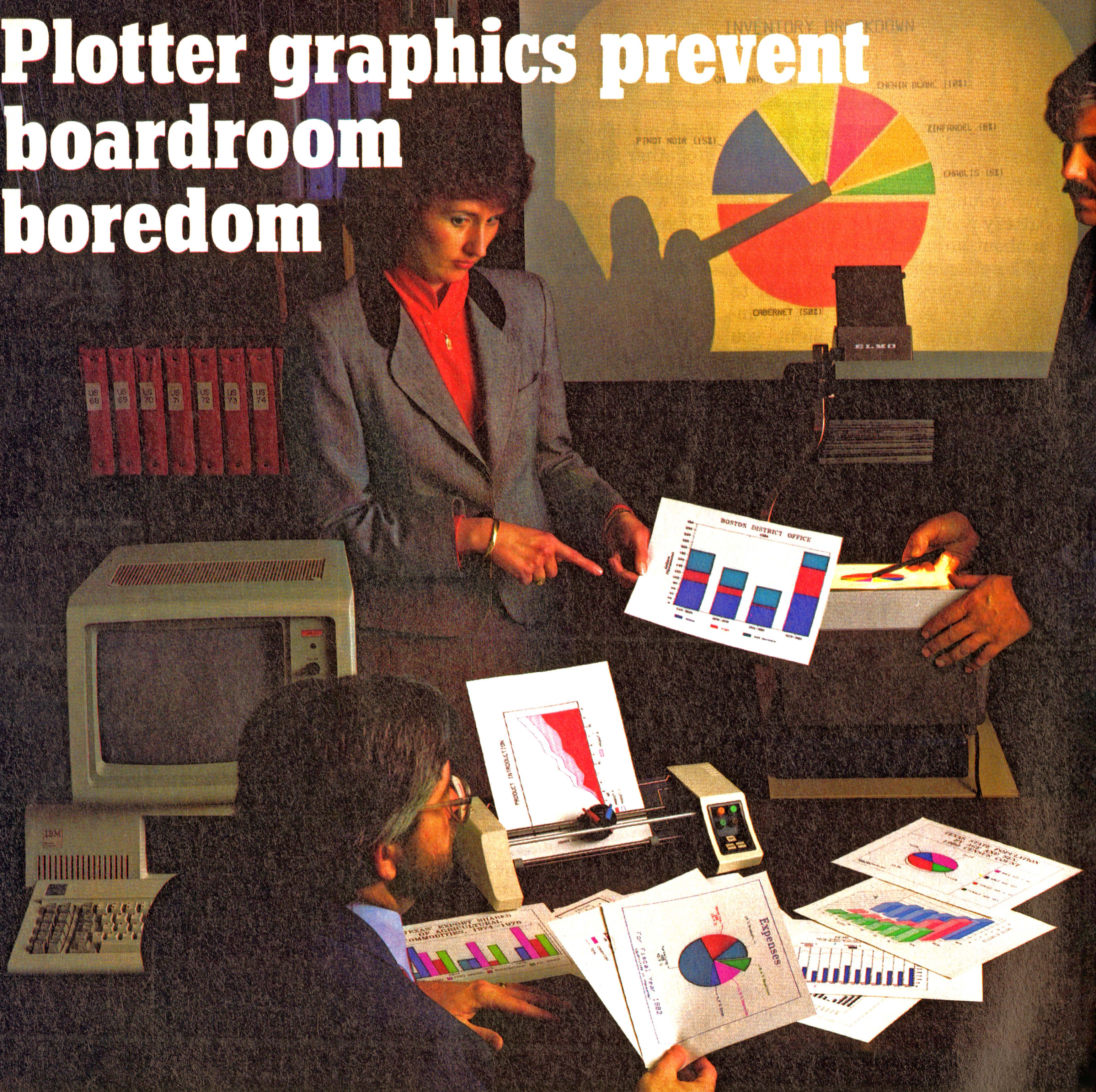
Software

The GridCase runs lots of software. First of all, Grid continues to offer its own proprietary operating system and a set of applications programs, including a word processor (GridWrite), a spreadsheet (GridPlan), a database (GridFile), and a communications program (GridTerm). To Grid's credit, these programs

Write, GridPlan, and GridTerm on ROM chips for \$350 each.

GridWrite is actually more of an editor and formatter than a word processor. You type in your text and insert commands that determine the appearance of the document when you print it out. The program has sufficient commands to manipulate, duplicate, delete, and move text

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POPULAR REVIEWS HARDWARE

within a file. With formatting commands you can set margins, indent, number pages, underline, write superscripts and subscripts, print headers and footers, and change typefaces. The typeface options include condensed, italics, boldface, and enlarged. The program is adequate for simple word processing and works quickly since it is RAM-resident, but it does not measure up to a high-powered MS-DOS word processor like WordStar.

GridPlan is an electronic worksheet with a maximum capacity of 256 rows by 256 columns. It includes trigonometric functions, a search command, and a split-screen option for viewing separate sections of your spreadsheet simultaneously.

Grid also offers a program called GridMaster (\$250) that acts like a simple calendar and database. With this program you can create a to-do list, a Rolodex-like file, or other simple database files. Unfortunately, GridMaster isn't as useful as, say, Borland's SideKick, because it doesn't run as a background task. Nor does it include communications capability.

IBM Compatibility

Grid's proprietary operating system and applications software are, at best, adequate. But as an IBM-compatible, the GridCase shines. With an optional \$150 MS-DOS disk, it ran all MS-DOS applications that I tried, including WordStar, 1-2-3, PC-Talk, Crosstalk, Multiplan, and Flight Simulator. Grid offers those programs on 3½-inch disks. Other popular MS-DOS programs Grid offers in a 3½-inch disk format include Framework, dBASE II, dBASE III, the PFS line, and Microsoft Word. (Multiplan, Crosstalk and dBASE II are also available on ROM chips.) Programming software is also available, including Microsoft's BASIC, C, FORTRAN, Pascal, and COBOL.

Grid also offers some of its own software and the MS-DOS operating system on 64K-byte user-installable ROM chips (\$300 for the MS-DOS ROM pack). The ROM-based software has the advantage of portability and speed in loading, and in many cases it obviates the need for a second disk drive.

The disk-based MS-DOS is version 2.11 and includes a full set of DOS utilities with an additional help utility that lists operating-system commands. The ROM version of DOS is barebones; it doesn't have the help file, the check disk, or assign commands. Formatting a DOS disk took more than two minutes, as opposed to the 41 seconds required on an IBM PC, but keep in mind that you won't need as many disks with this computer. With both MS-DOS and 1-2-3 on a disk, you still have nearly 500K bytes of storage left. Other disk operations were slightly faster than an IBM PC's.

Another curtesy to IBM compatibility is the inclusion on the DOS disk of files called PCMASTER and PCSLAVE. Despite their disturbing names, they are very useful, allowing you to connect your GridCase to an IBM PC, directly access the PC's disk drives and move from one computer to another. Since these functions are so valuable, they deserve a much clearer explanation than that presented in the Grid MS-DOS manual. The documentation also doesn't consider some of the different PC-compatible configurations that should work with PCMASTER and PCSLAVE. I was able to get the GridCase to access my external hard disk by shuffling statements in the configuration file, a reasonable but undocumented adjustment.

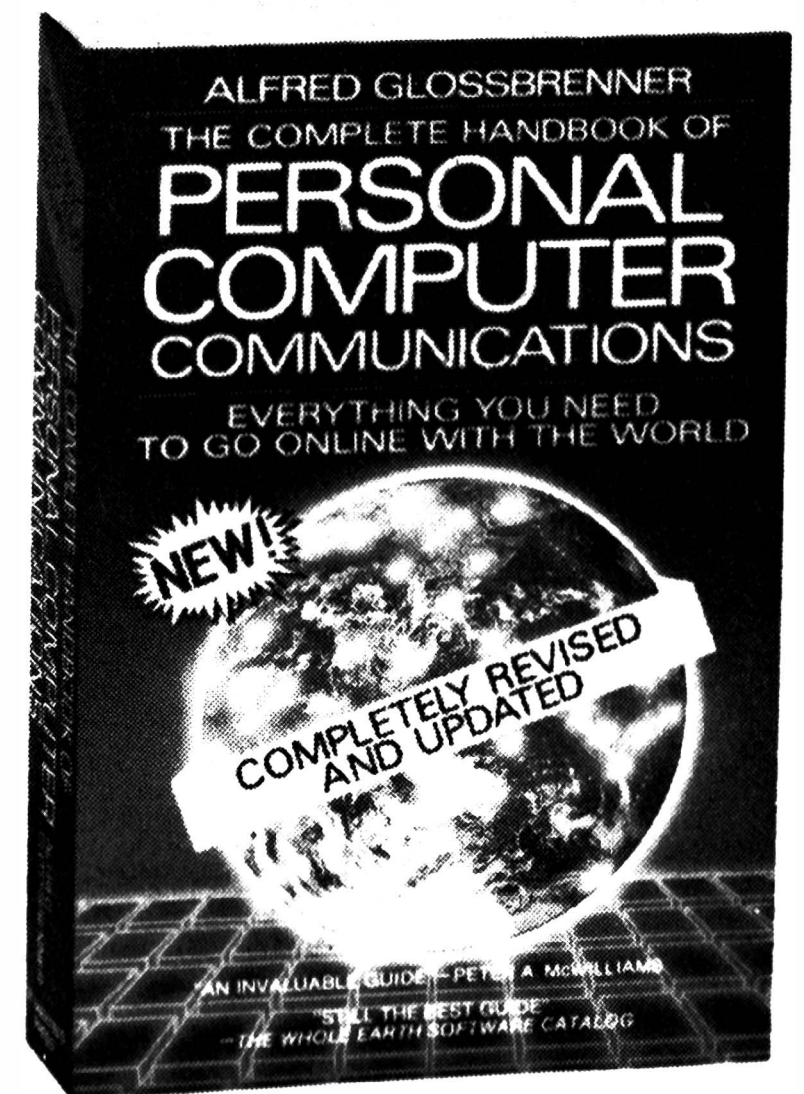
Overall the GridCase is a well-built, sturdy, and reliable computer. If you plan to use it with Grid software, be prepared to get a system with 512K bytes of RAM. For IBM-compatible software, 256K bytes could be adequate, depending on the programs you plan to run.

It is as an IBM compatible that I like the GridCase. Of course, the unit is not without fault. It cannot take add-on boards, the LCD displays on the models 1 and 2 are only tolerable, and it's expensive. But the gas-plasma display on the GridCase 3 makes it a very appealing system with a clear advantage when placed side-by-side with a Data General One.

—PAUL FREIBERGER

Paul Freiburger is a West Coast editor for *Popular Computing* and coauthor of *Fire in the Valley: The Making of the Personal Computer* (Osborne/McGraw-Hill, 1984).

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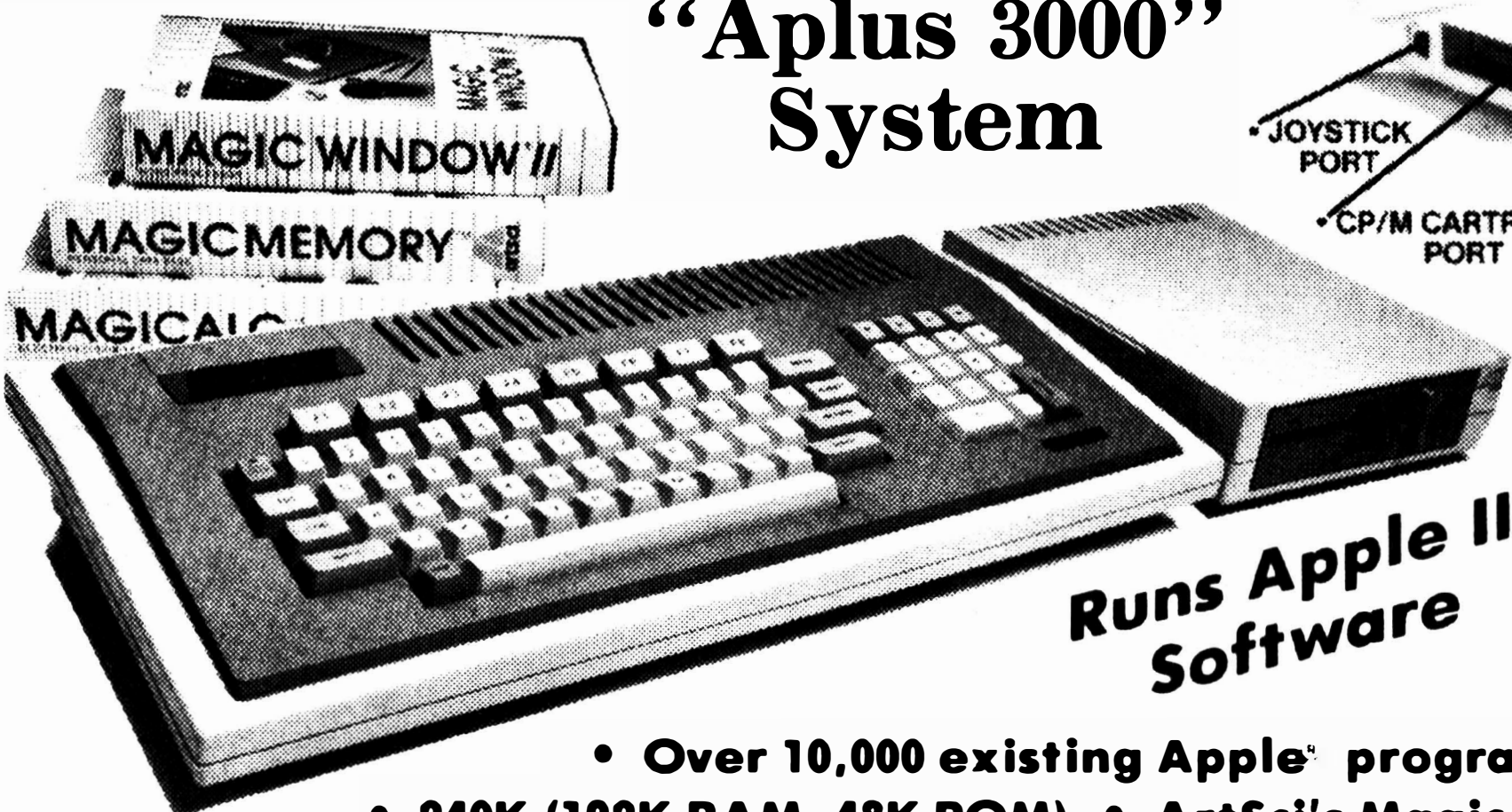
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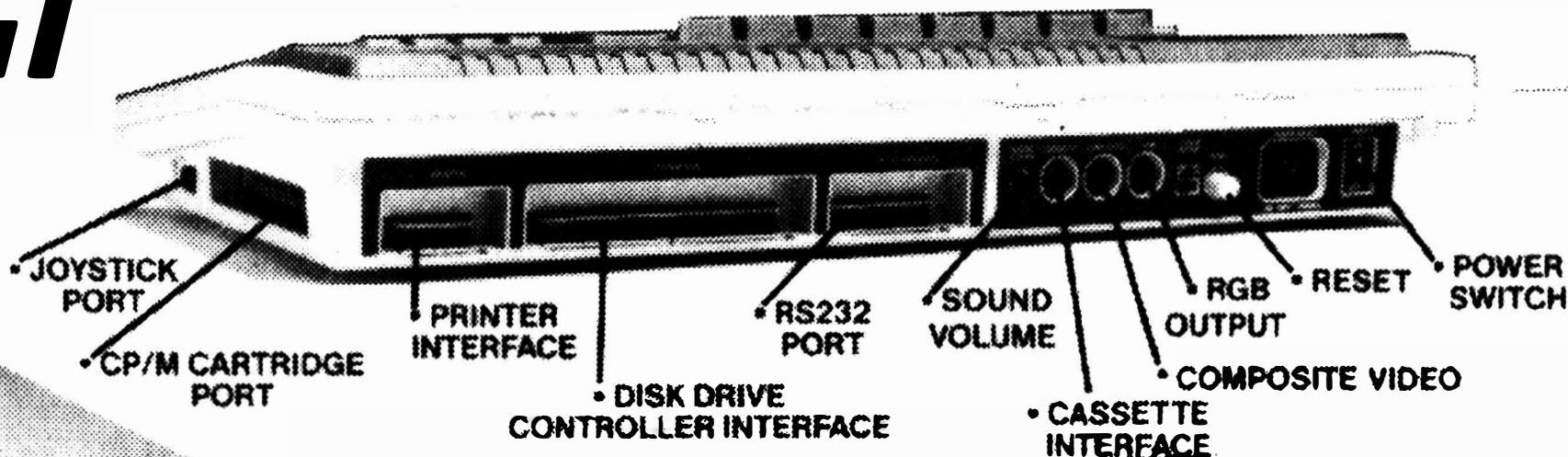
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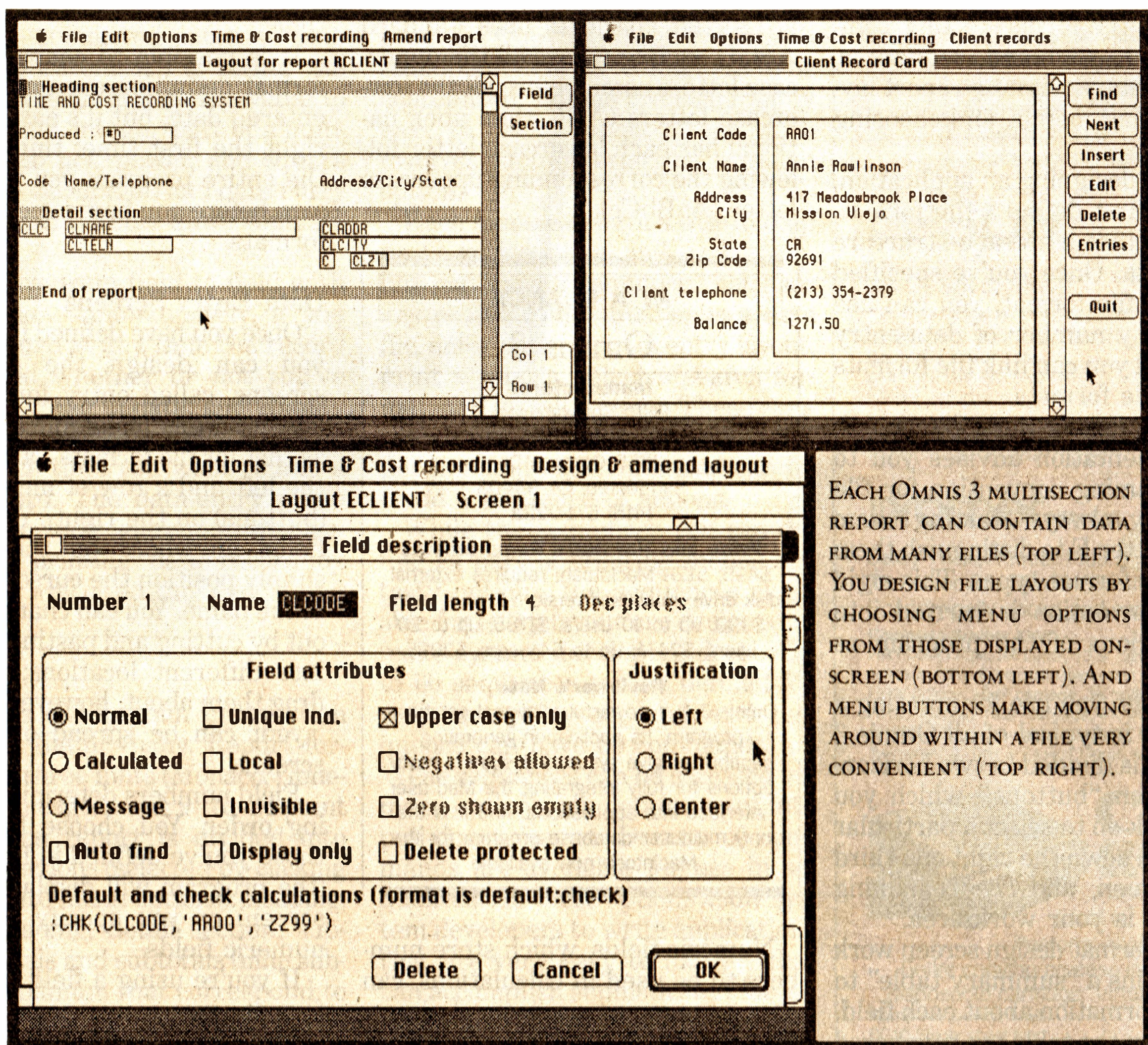
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POPULAR REVIEWS SOFTWARE



Omnis 3

This high-end development tool for the Mac is best suited for people who write database applications for others to use

Omnis 3 hopes to be the dBASE III of the Macintosh world. A relational database management system with applications-generating capabilities, Omnis 3 is designed for those who write business programs other people will use—applications such as billing systems for doctors' and lawyers' offices, sales and inventory tracking, and personnel and payroll files.

A powerful program for big jobs, Omnis 3 isn't easy to learn. It doesn't have on-screen help, and it demands that you be as organized as it is. You're going to have to learn a new language when you use Omnis 3, just as you

would with dBASE. However, Omnis 3 makes such good use of the Mac's interface that you can use the mouse for virtually everything—even designing an entire system. The only thing you have to use the keyboard for is typing in file names and field lengths.

Omnis 3 has provisions for letting you incorporate pull-down menus and dialogue boxes into applications you write. Password protection lets you control who can access what data. And, according to Blyth Software, a single-user system adjusts automatically to a multi-user system, taking care of record locking. (I used the single-user version for this review.)

Creating a database application, which Omnis 3 calls a library, involves defining file formats, designing data-entry forms, setting commands and command sequences, entering data, designing report layouts, creating menus, and choosing passwords.

To begin designing an application, you must first define a file format, which specifies a storage structure for the data. Once you've specified fields in a file format, you can use them in any number of data-entry forms. And you can link file formats to other file formats.

Each file format must be named; the documentation advises you to adopt a naming convention for file formats by always starting them with the letter F to distinguish them from other format types. This rigid naming convention is carried into other portions of the program as well.

The screen you use for creating a file format is typical of all Omnis 3 screens: it is divided in two horizontally. Option "buttons," which you simply click on to select a particular option, run down the right one-third of the screen, and the remaining two-thirds is your work area.

The file-format design screen work area contains a "summary table" to display information about each field. The rows on the table are numbered down the left side, and these numbers become each field's number. The column labels across the top—Name, Type, Length, Dps (decimal places), and Indexed—describe the kind of data each field contains.

Defining Fields

You click on the buttons to enter detailed information about the fields, including name, type, length, number of decimal places, whether it's indexed and, if so, the index length.

The documentation helps you stay organized, suggesting you use the first two characters of the field to indicate the file name and the next four or five to describe the field. In the sample data, a field is named CLCODE—the first two letters are from the file-format name FCLIENT, the last four describe the field's contents, a client code.

You can choose from six field

types. Character and national both hold up to 60 alphanumeric characters and differ only in the way they are sorted: character uses standard ASCII sorting where all the uppercase letters come before all the lowercase letters (ABC then abc); national has each lowercase letter following the corresponding uppercase letter (AaBbCc).

AT A GLANCE

Omnis 3

Manufacturer

Blyth Software Inc.
Suite 150
2655 Campus Dr.
San Mateo, CA 94403
(415) 571-0222

Price and Hardware Requirements

\$495; 512K Macintosh; requires external disk drive; multiuser version: 2 to 5 users, \$990; up to 10 users, \$1785; up to 20 users, \$2474; up to 64 users, \$2995

Reviewer's Note

Omnis 3 is a powerful relational database program. Its application-generating capabilities give systems designers many options for fully integrating the Mac user interface into applications. And it is the only multiuser database program for the Macintosh now available.

Numeric fields, which store numbers to be used in calculations, can have as many as six decimal places. Boolean fields store yes/no values that can be used in formulas, as can date fields, the fifth type. The sixth type of field is a "sequence" field whose value the program assigns automatically—one per record. These fields are maintained whether or not you add them to the file-format definition. If you do add them, you can use them to link files when you're designing an application.

You can have 12 indexed fields in each file. The program creates an index table that contains index data and record sequence number for each and uses this table to find records. The index tables are updated whenever you add, delete, or edit records, so the fewer and shorter the indexes, the faster your records will be processed and the less disk storage they'll take.

Omnis 3 allows 120 fields per record and 79 characters per field. The number of records per file is not

limited by the program but dependent on the size of each record. And you can have 12 files open at one time.

It is possible to change the file-format definition even after you've entered data, but it's easier to do it right the first time: think through the entire program you plan to design before you begin specifying file formats.

Data-Entry Screens

Once you have defined file formats, you can design the data-entry screens, called entry formats. The layout screen looks much the same as that for file formats—a window on the left and a row of menu options (buttons) on the right. You can put fields anywhere on the screen—simply position the cursor and type in the name. You can change the layout by cutting and pasting the fields into different locations; you can't drag them about, however. An entry layout can be spread out over 12 screens.

Field numbers determine processing order. You choose fields from those you've defined in file formats (the program will display a list on-screen) or you specify temporary numeric fields.

If you're using a field from a file format, you can choose a display length that's different from the storage length. In addition, you can select field attributes, such as calculated; message only; auto find (for entering values used as indexes to locate records—a customer code, for example); unique (for index fields); local (to view data from linked transaction files during data entry); invisible (for storing intermediate calculations that don't need to be displayed); display only; uppercase only; negatives allowed; zero shown empty; and delete protected.

Any of the fields can have default data entered, and whether or not default data is present, data in the field can be checked. Formulas for calculated fields and for checking data can use mathematical operators (add, subtract, multiply, and divide), relational operators (less than, greater than, equal, and not equal to, etc.), and logical operators (and, or). Operations can be grouped using

parentheses. Functions supported by Omnis 3 include absolute values, character-by-character string comparisons, compound interest multiplier, concatenation of string values, conversion of a string value to a date value, integer part of a number, logical not, power, and square root. The calculation and data-entry controls can become quite sophisticated.

You move from field to field with the tab key—unfortunately, if you press return at any time the record is entered whether or not you've finished typing in data; and equally awkward, you must select insert again each time you want to add a new record. The data-entry menu options include searching, displaying, and printing data record by record as well as editing and adding records.

Reports

Reports can contain information from one file or many. Report formats use three fonts (Monaco, Geneva, or Chicago), and 9- to 24-point type. Each report is divided into several sections (selected by clicking appropriate menu options): heading, detail heading, detail section, sub-totals, totals and subtotals (nine sub-totals maximum that correspond to sorting levels), and end of report.

You can control the report format and the resulting printout through on-screen design and through setting parameters such as specifying that lines with empty data fields shouldn't print, setting specific top and bottom margins, and variable justification.

Search formats that determine how the data is filtered before a report is produced can be specified as part of report parameters or selected at report time. You begin a format definition by naming the format. Each format can have up to 50 "search lines." Each search line is used for one of four types of searches: a comparison, calculation, an "and" operator, or an "or" operator.

Comparisons are of fields and their values (data) and include the following types: greater than or equal, less than or equal, not equal to, equal to, contains, and begins with.

Designing Menus

Despite the sophisticated relational capabilities, the power of this program from a system developer's standpoint is in its willingness to be customized. Menus are remarkably easy to design: most of the work involves simply selecting a menu option.

Each menu can have a title and up to 18 option lines, and each menu line can have a sequence that uses any of five commands: open a data file, enter data using an entry layout, print a report, select a search format, and install a menu. These commands can be used more than once per line and each command can include a sequence of actions.

While the sequences you can define as part of creating menus are tasty options, the sequences available for entry layout are designed to make system developers drool. Up to 60 sequences can be defined for each entry layout, and each sequence can have 60 commands.

The sequences can be accessed via menu options you define or put into pull-down menus. Dozens of commands are available for use in sequences. All these options allow system developers to write applications that are very easy to use yet that can accomplish sophisticated file relating and generate highly detailed reports.

In addition, Omnis 3 includes utilities for importing and exporting DIF files used by VisiCalc and other spreadsheets, Multiplan SYLK files, comma-delimited files, and a format called "one field per line."

Omnis 3 is not for first-time database users who want instant results. It is, rather, a powerful tool for those who want to create turnkey application programs that others will use. With this in mind, Blyth Software intends to offer developers run-time disks for \$40 each in quantities of 500 or more. Although Omnis 3 can certainly be a productive tool for individuals, it will come into its own in Macintosh office systems that have many users tied into a network that includes a file server for massive data storage.

—BARBARA ROBERTSON

Barbara Robertson is a California-based freelance writer.

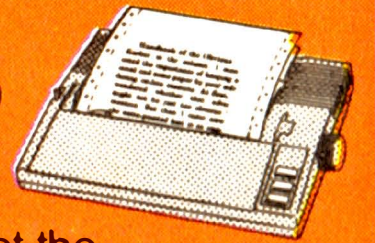
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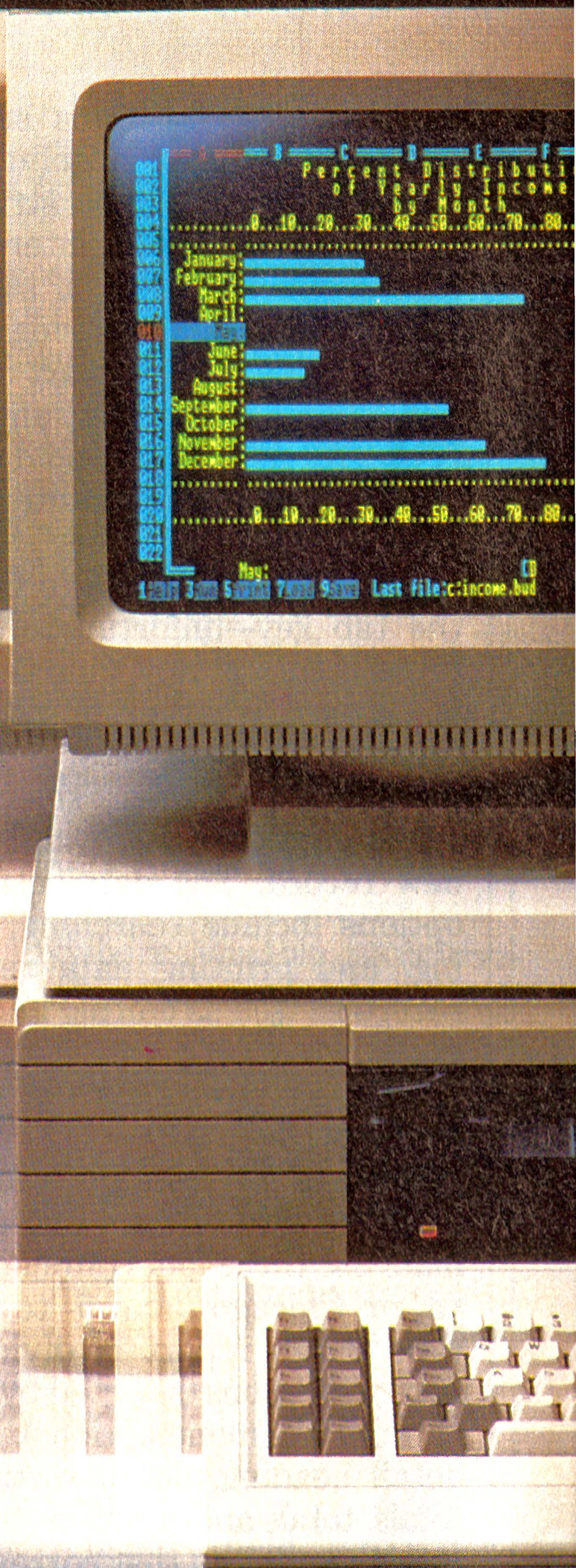
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5	6	7	
Justify Column Heading: Default (Left-Justify)		Justify Data Value: Default (Left-Justify)	
Output Attribute(s):		Column Width: Default (25)	
Spacing Between Columns: 0		Text for Blank Field: Default ()	
Report Width: 76			
Enter the first letter of an option to justify the column heading. Options: C enter, L eft-Justify, R ight-Justify or D efault.			
FIRST-COL PREVIOUS-COL NEXT-COL LAST-COL EDIT-COL-HEAD ALL-COLS DONE			

Power-base

Menus map easy routes through this relational database for the IBM PC

Sophisticated database management software once demanded the skills of an expert programmer, but menu-driven packages came along and changed that, taking a lot of the anguish out of keeping track of business records.

Power-base has joined the ranks of this new group of friendlier database software. A relational program for the IBM PC, Power-base is designed for managers who want to get right down to the nitty-gritty of creating files, entering information, searching the database, and producing customized reports.

Though menu-driven, Power-base has a special mode for typing commands manually. In either mode, a command-menu line is conveniently ever-present at screen bottom. You select and execute all operations with just three of the IBM PC's function keys: F9 and F10 highlight selections, and F8 executes your choice. A function-key template comes with the package.

Power-base is about as straightforward a program as they come. You learn all the basics in a 184-page tutorial that forms the largest section of the illustrated manual. The

disk-based tutorial has you tinkering with sample databases and offers ideas on how you might construct your own files. Examples included are real-world business applications: client addresses, invoice statements, and sales representatives' records.

And those who wrote the documentation make no assumptions that might lead novices astray. The tutorial could almost double as a general introduction to the basics of using a computer as well as file management.

The program doesn't have on-line help, which means that you'll have to turn to the manual for direction. But it shouldn't take long to wean yourself from the documentation.

Some Stats

Power-base lets you access 10 different files at one time. Each file can handle up to 65,534 records. Each record can contain 64 fields for a total of 1600 characters per record. Each field can be 80 characters long. Power-base does not let you scroll, however, so each record must be contained in one screen—21 lines by 80 columns wide. Thus you might run out of room if you try to cram 30 or

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more fields into a single record. (The way around this limitation, according to a company representative, is to use the program's relational capabilities to generate reports that combine the records of two or more files.) You can store up to 64 files per floppy disk or hard-disk subdirectory.

While the 80-character field limit may present no problems for most business applications, it may be confining for those who need to store blocks of text as part of research or academic-type database applications.

The main menu presents five options: Use, Define, Utilities, Change-Application, and Done. Use and Define are the commands you'll select most often. Use displays a directory of your files for adding and deleting information or changing field definitions. The Define command creates new files. The Utilities component is the ticket to exchanging information between Power-base and dBASE II, Lotus 1-2-3, WordStar, Multimate, PFS:File, VisiCalc, Multiplan, ASCII

and DIF files, and a host of other programs and file formats. Change-Application provides commands for switching

directory, setting password protection, or creating a new subdirectory for Power-base files. Done, which appears in every menu, gets you out of the current command menu.

One of Power-base's greatest innovations is in the way it lets you construct your database. Many programs require that you define fields first and then, if you wish, customize data-entry screens based on those definitions. The designers at Power-base Systems rightly figured that most everyone would prefer to enter information in attractive screen layouts rather than vertical columns with abbreviated field name prompts. As a result, data-entry screens are created from the start with field prompts (such as name, address, telephone number) that can contain up to 40 characters.

What's more, you can add text such as a title, special punctuation,

and borders to highlight specific areas of the data-entry screen. And you can define text, field names, and data entries in standard, bright, or highlighted video for a customized display.

Power-base offers a full range of field types, including alphanumeric, date, money, number, and yes/no. And you can establish rules for data entry. For instance, you may wish to have data entry mandatory for a particular field; set minimum, maximum, or default values; require a unique value for data entry; or specify a record entry to be automatically set in uppercase.

Flexible Fields

You also have the option of creating calculated fields, such as a price field equal to the unit cost multiplied by total number of items sold. Other arithmetic operators include addition, subtraction, and division, which can all be used in complex formulas. You can create calculated fields using the "and" and "or"

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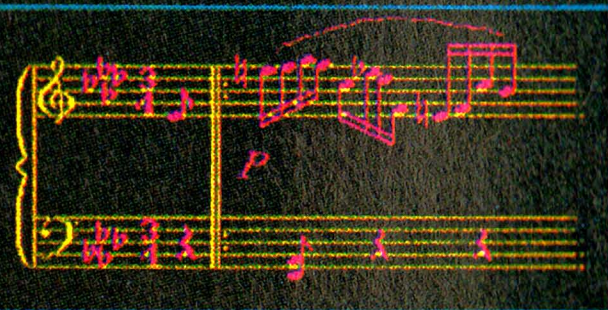
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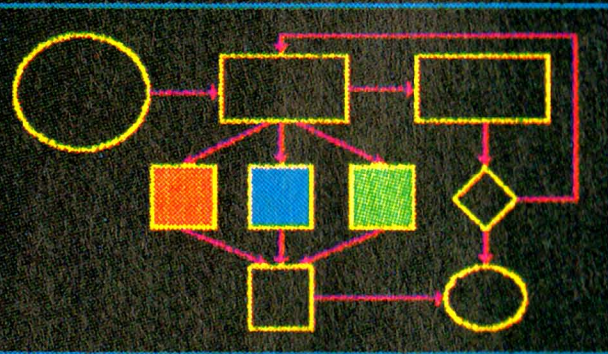
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operators but not "not." Finally, Power-base lets you create one-line help messages for each field.

Revising a field is child's play. You move the cursor to the field and select Modify-Field from the command menu. If you want to reposition a field, the Rearrange command lets you move it anywhere except to a place occupied by another field.

When you want to enter data you choose the Add-Data command. To display records one after another you use the Edit-Scan command. (The command menu also includes options to let you view the first, last, previous, and next record.) And to produce a columnar listing of fields you use the List command.

The Select command homes in on a specific record or group of records. To search a file, you simply fill in the appropriate fields from your data-entry screen with the desired record information. You can also use Select to create conditional and/or searches. For example, you may wish to view a list of clients who live in New York City "and" have a last name of Smith. An asterisk serves as a wildcard character in data searches. Entering P* in a last-name field would produce records of individuals with a last name beginning with the letter P. There are a variety of mathematical operators, including greater than and less than, for numerical and money field searches.

Power-base is forgiving. If you choose a menu selection and change your mind, punch Esc to undo the error. The same effect can be achieved with Start-Over from the command menu. There are also some handy field-editing commands using the Home, End, Ins, and Ctrl-End keys. If a lot of your records contain identical information in certain fields, you'll like the F3 key. It duplicates a field value from the previous record entry into the current blank field in a new record.

Relating Files

But the true power of relational database management programs lies in tying several files together to eliminate the retyping of duplicate information. For example, name and address field data from a business client file could be used in a purchase

Current File: CLIENT7

FIELDS-ON-LABEL

Fields in File CLIENT7 :

ACCONO	LASTNAME	FNAME	STREADDR	CITY	STABBR	STNAME	ZIPCODE
AREACODE	EXCHANGE	LOCAL	SALEREPN	SALCUST	TOTASHIP	LASTSHIP	TOTASALE

FNAME LASTNAME
STREADDR
CITY ST
 ZIPCO ■

Position the cursor where you want the next field to begin, or type any text.

START-OVER BACK-UP **CHOOSE-FIELD** DONE

DESIGNING A MAILING LABEL INVOLVES POSITIONING THE CURSOR AND CHOOSING A FIELD.

order file. Thus the secret of database efficiency is the creation of fields with common information so that files can be related.

Power-base provides a Lookup field that lets you use field values from records in other files. For instance, you may wish to create an employee records file and a separate

and a fill-in-the-blank format. It's an effortless process.

But a more powerful way to relate several files is through the program's Zoom command. It's an automated way of using a field from one file to retrieve record information from several other files. For example, an account number from a customer file could be used to access invoices from another file. The Zoom and Unzoom commands allow you to examine records from one file and then take a peek at records from other related files. Power-base limits you to 10 levels of such "zooming." Even novice database users can tap into the power of related files.

Reports

Power-base features an excellent menu-driven report capability. You can select headers, footers, sorted and totaled fields, and arrange the location of information in a report simply by moving the cursor to the desired spot. Power-base includes special custom layout commands to design columnar reports in just about any format imaginable. Naturally, your report formats can be saved for later use. In addition, mailing labels are designed on-screen and the program can handle sheets or single columns of labels of any dimension.

Those with hard-disk systems will appreciate two important aspects of Power-base. It is not copy-protected, so you can copy all the program files onto your hard disk via a special setup routine. And, more important,

AT A GLANCE

Power-base

Manufacturer

Powerbase Systems Inc.
32100 Telegraph Rd.
Birmingham, MI 48010
(313) 540-2398

Price and Hardware Requirements

Version 2.1, \$349; IBM PC, XT, AT, compatibles, the Data General One, and the PC 3270; versions also available for 3½-inch-disk MS-DOS systems and the Wang PC; requires 320K bytes of RAM and DOS 2.0 or higher and two floppy-disk drives or one floppy drive and a hard disk

Reviewer's Note

Power-base should rank among the top choices for menu-driven relational database managers. It is perfect for executives and office staff in small-to-medium-sized businesses who don't have time to learn the technical aspects of information management.

performance evaluation file. With the employee's name as the common data, the performance evaluation file could use hire date, salary, or other field values from the employee records file. Once again, Power-base streamlines the process of creating Lookup fields with menu commands

you can store and access database files on several subdirectories—a feature that promotes organized files. In addition, the program lets you create subdirectories without having to return to DOS. Those with floppy-disk systems, however, will find they're in for some tedious disk swapping.

Power-base is packed with other useful features too numerous to mention here. There are a host of file maintenance utilities for backing up your information or selectively deleting groups of records from a file, among others. You can also copy a file definition without record data for use in another application.

The most recent release of Power-base is version 2.1. The main enhancements in 2.1 include TopView compatibility, support for 30 languages, password protection, and enhanced reporting and printing capabilities. But here's an additional benefit: the manufacturer offers free product upgrades during your first year of use. (Version 2.2, which will include a few minor changes and no significant differences, is scheduled for imminent release.)

Power-base sells eight application templates (\$29.95 each) that save you work. They are a membership association management system, business T&E analysis system, fixed asset management, human resource management system, inventory control management system, job costing, order processing and invoicing, and sales prospect tracking system.

Power-base is a flexible relational database program that features a well-designed system of menus and fill-in-the-blank prompts to take the hassle out of information management. You'd be hard-pressed to find a database system that is easier to work with yet offers most of the features demanded by serious users. The program can take the drudgery out of managing large volumes of information, and it doesn't require any experience in database management. In that way, it's an ideal program for people who are more interested in the end product than how they got there.

—JOEL C. DON

Joel C. Don is a California-based freelance writer specializing in science and technology.

BUSINESS

PRODUCT FILE MAINTENANCE									
INVENTORY # 400100		DESCRIPTION DISKS							
MEASURE	CASE	FRACTION	24	TYPE	DI	BIN	WH07	VENDOR	R001
SALES PRICE	44.000	TAXABLE? (Y/N)	Y			LAST SALE DATE	850505		
MINIMUM	50	REORDER	100			LAST PURCHASE DATE	850505		
LST. PURCH. PRICE	26.550	STANDARD COST	0.000			AVERAGE COST	26.550		
ON HAND		UNITS	114.000	DOLLARS		3026.700			
COMMITTED		UNITS	0.000						
ON ORDER		UNITS	0.000						
STATISTICAL INFORMATION									
	YR. BEF. LST	LAST YEAR	THIS YEAR	FORECAST	VARIANCE	%			
UNITS PURCHASE	45	40	150	183	33-	18.0-			
\$ PURCHASES	1152	1130	3982	4918	936-	19.0-			
UNITS SOLD	32	33	36	37	1-	2.7-			
\$ SALES	1415	1485	1584	1663	79-	4.8-			
\$ COST	875	882	955	984	29-	2.9-			
\$ PROFIT	540	603	629	679	50-	7.4-			
TIMES TURN	0.3	0.3	0.3	0.3	0.0	0.0			
GROSS RETURN	1923	2083	1991	2092	101-	4.8-			

Dac-Easy

This \$69.95 IBM PC accounting package does the job of software many times its price

Even though computers have become less expensive—almost commodity items—the surge of small-business use predicted by industry observers hasn't materialized as expected.

One reason many smaller businesses have not flocked to embrace the microcomputer is the cost and complexity of applications software, especially accounting software. While a large number and variety of accounting packages are available, prices for the vast majority of these range from \$200 to \$700 per accounting module.

It is not uncommon for a prospective purchaser of the big four applications—general ledger, accounts payable, accounts receivable, and inventory—to receive price quotes in excess (sometimes greatly in excess) of \$1000. Considering that \$70 today buys you two game programs, a reasonable question would be “How good could a \$70 accounting package be for serious business applications?” Well, it looks as if the expensive packages face some real competition with Dac-Easy Accounting.

This remarkably inexpensive seven-module package offers the features and usability of software costing many times its price. For less than other companies charge for electronic checkbooks, Dac-Easy provides modules that perform general ledger, accounts payable, accounts receivable, inventory, purchase order, billing, and forecasting. While the billing and purchase order modules function more or less as adjuncts to the accounts receivable and the accounts payable modules, the others can be run as full, stand-alone applications.

Start-up

Dac-Easy comes on one double-sided disk and runs on the IBM PC and compatibles with 128K bytes of RAM and one floppy disk. But because the number of accounts and transactions you can work with is dependent on available disk space, a single floppy-drive system will be suitable only for the smallest businesses. A much more realistic hardware setup would be one with two floppy-disk drives or a hard disk.

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Now this discovery posed a dilemma: how to cut the price of diskettes without lowering the quality.

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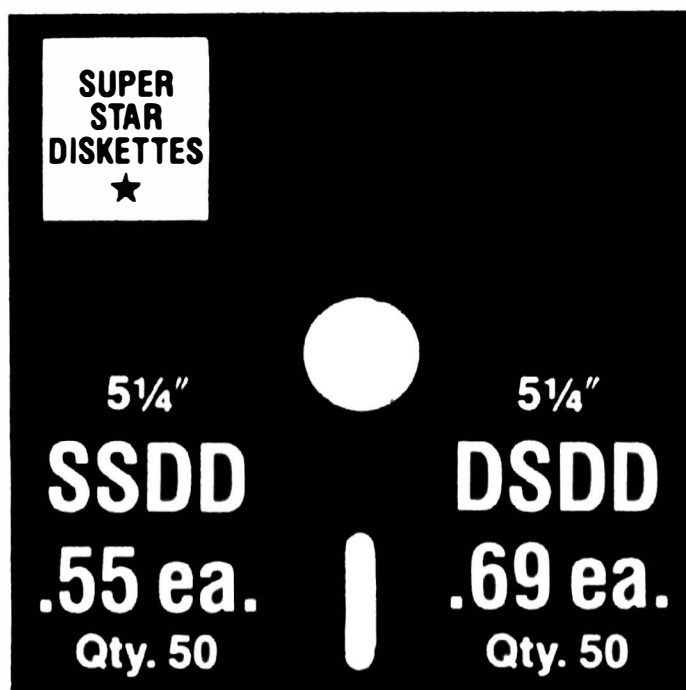
Rather they are fabricators or marketers, taking other company's components, possibly doing one or more steps of the processing themselves and pasting their labels on the finished product.

The new Eastman Kodak diskettes, for example, are one of these. So are IBM 5¼" diskettes. Same for DYSAN, Polaroid and many, many other familiar diskette brand names. Each of these diskettes is manufactured in whole or in part by another company!

So, we decided to act just like the big guys. That's how we would cut diskette prices...without lowering the quality.

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Instead, they concentrate their efforts on turning out the highest quality diskettes they can...because they sell them to the software publishers, computer manufacturers and other folks who (in turn) put their name on them...and sell them for much higher prices to you!

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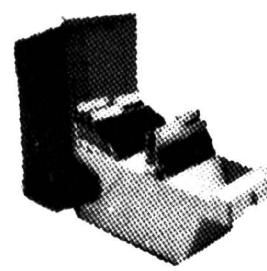
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POPULAR REVIEWS SOFTWARE

showing of consideration for users, the documentation provides detailed instructions for entering starting balances whether you are opening your books at the start of your financial year or sometime after that.

The entire system is completely menu-driven, and its well-designed data-entry screens further simplify program operation. While each module's screen is different, an examination of the general-ledger transaction-entry screen will serve as an illustration. This screen permits a two-character journal code and a number for each transaction. This practice is fairly common among accounting packages, providing an audit trail that allows you to trace individual transactions back to their sources.

After you've entered the journal code and transaction number, you can enter the individual transactions one line at a time. It is here that Dac really started to impress me. A data-entry screen can accept 18 lines of transaction input (one debit or credit on a line). If your journal entry requires more than 18 lines, which is common, the screen clears, the last line entered appears at the top of the screen, and you can continue to enter transaction lines. Dac allows an unlimited number of transaction lines for each entry.

As a safety feature, the data-entry routine will not allow an unbalanced entry (where debits and credits are not equal). The manual suggests that your chart of accounts contain account number 9999 as Voucher Difference. If your transaction is out of balance, and you enter the letter "D" (for difference) in the account number field, the software will automatically prepare a balancing entry to the "difference" account. After you have finished all your transaction entries, you can go back and correct any out-of-balance transactions. You can correct any entry made in each of the individual applications up to posting time. After you post an entry, it cannot be modified.

Reports

Dac-Easy also shines in the area of reports. There are a multitude of these in each of the application modules, and many of the reports give you tremendous latitude as to the

range of accounts and dates of transactions to be included. The general ledger provides journal reports, account activity detail, a trial balance, a balance sheet and income statement, and a chart-of-accounts listing.

Each of the other modules also contains a full complement of reports: accounts receivable prints statements, journal lists, mailing labels, sales analysis, as well as an excellent aging report. You can

AT A GLANCE

Dac-Easy

Manufacturer

Dac Software Inc.
4801 Spring Valley Rd.
Building 110B
Dallas, TX 75244
(214) 458-0038

Orders: 800-431-0800 operator 201

Price and Hardware Requirements

\$69.95; IBM PC, XT, AT, PCjr, and compatibles; 128K bytes of RAM

Reviewer's Note

Dac-Easy represents a remarkable value. The seven-module package is suitable for users with a wide variety of differing needs and experience levels. Payroll is not yet available but is expected shortly.

specify the aging period, and the report can be used to forecast cash flow as well. Payables also offers a similar aging report, as well as check printing and mailing labels.

Dac-Easy's inventory allows you to specify fractional units (such as units per case, dozen, gross, and the like) and supports several costing methods. Average, standard costing, and last-in-first-out are available. First-in-first-out costing is not. This omission is surprising as it is a very common and widely used method.

All four of the major applications (GL, AR, AP, and inventory) can maintain a three-year account history that you can query. This account history is also used by the forecasting module. This module offers four methods—previous year's figures, previous year plus or minus a percentage, previous year plus the difference between last year and this year, or a trend-line analysis using a three-year history.

The trend-line analysis is performed using the least-squares method. This forecasting feature is an unusual one

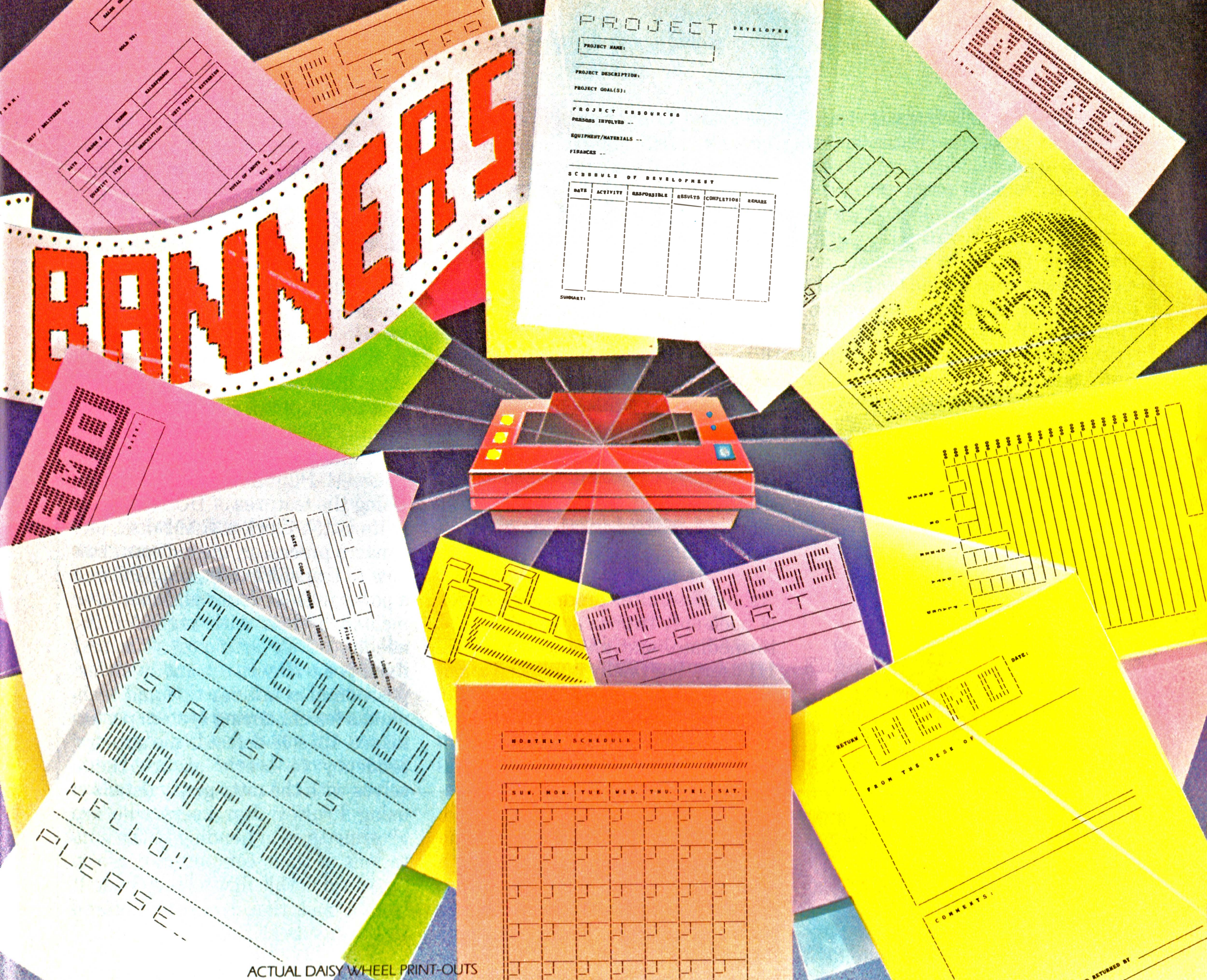
and also contains the ability to print a variety of statistical reports for each of the applications. For example, the inventory statistical year-to-date report gives the number of units, dollar sales, dollar cost, dollar profit, and units and dollars purchased for each item in the inventory. It provides this information for the current and two previous years, as well as a forecast for next year. My only criticism of the forecasting module concerns the documentation. The manual again makes what I consider an unwarranted assumption—that everyone will know the relative merits of using each of the available forecasting methods.

In keeping with its extremely reasonable purchase price, Dac Software also offers an inexpensive service agreement. For a \$50 annual fee, you are allowed up to one hour of telephone consultation. The service agreement terminates at the end of a year's time or when the hour has been used up, at which point you may renew it. Dac does not offer a toll-free telephone number, and if the technical support people have to call you back, they call collect. Considering that many other software producers charge \$100 or more per module, Dac's charges for product support strike me as being extremely reasonable. A service agreement also entitles you to future product updates for \$7.50.

Dac-Easy Accounting is an amazing product. At a price usually associated with games, it provides much of the same functionality and features of packages costing up to 30 times as much. Moreover, it is usable by both beginners and experts, and in a large range of business types and sizes. Topping this all off is Dac's "Money Back Guarantee." If you are not satisfied with the program, return it for a refund. At the present time Dac-Easy does not have a payroll module, but the folks at Dac Software say they are working on it and in fact should have released it by the time you read this. Even without the payroll, Dac-Easy Accounting represents a true bargain.

—THEODORE NEEDLEMAN

Theodore Needleman is a practicing accountant and a principal in the New York-based consulting firm of IDEA Technology.



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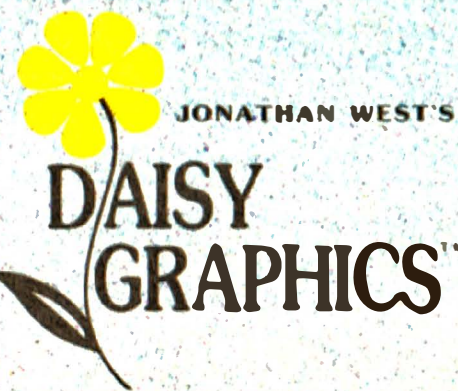
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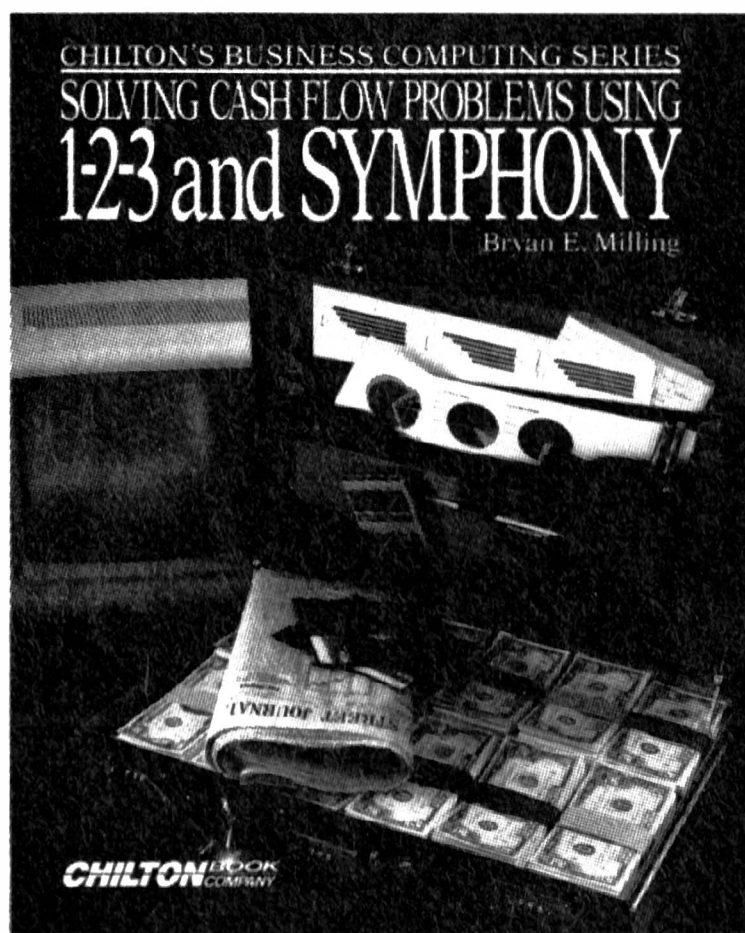
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Year-end Choices

MICRO REVIEWS



Solving Cash-Flow Problems Using 1-2-3 and Symphony

Bryan E. Milling, David O. Olson, John A. Reesman, and William Connor

Chilton, Radnor, PA, 1985, 320 pages, paper \$19.95

In the high-wire act that all too frequently is the financial management of the small-to-medium-sized business, it is foolish to work without a net. The authors have attempted to provide just that by using accounting fundamentals, case studies, and 1-2-3 and Symphony spreadsheets. Cash flow is treated first as a natural consequence of efficient management of inventory and receivables, then as it relates to the other balance sheet items, and finally, as one of the goals of prudent financial leverage. Though even novice managers will find some of the examples simplistic (financial ratios and break-even analyses), the general quality of each section is high. Of special note is a topical chapter on float management and a number of bottom-line analyses of alternative credit terms and financing options. This book will certainly not transform its readers into either power users of Lotus and Symphony or financial Flying Walendas, but it will

teach valuable lessons in the wisdom of computer-aided cash-flow management.

dBASE III Trail Guide

Howard Dickler

Ashton-Tate, Culver City, CA, 1985, 431 pages, book/disk \$29.95

Ashton-Tate, after producing a series of book-only tutorials for novice, intermediate, and advanced dBASE III users, has finally published an interactive book/disk package for those new to dBASE III. The book is both light and serious—Dickler, in keeping with Ashton-Tate's ad campaign for dBASE III, uses data related to running a zoo for his specific application examples. At the same time, the guide succeeds in laying a trail that will lead the reader from complete unfamiliarity to proficiency with the software. From basic procedures like installing dBASE on a particular system to advanced techniques like creating an audit trail, Dickler steers the reader through the full range of dBASE features and functions in exhaustive detail. The prose is highly formal and academic (the text is even supplemented by the author's footnotes), but readers who do not get lost along the way will find that this hands-on tutorial offers a superior introduction to using and programming dBASE III.

The Fully-Powered PC

Burton L. Alpertson, Andrew Fluegelman, and

Lawrence J. Magid

Simon & Schuster, New York, 1985, 302 pages, book/disk \$34.95

In arguing that the IBM PC's power remains fragmented by the lack of consistency among software products, the authors note that many users have been forced to "simply ac-

cept the stupidities and work around them." Others, however, have actively sought a solution, and *The Fully Powered PC* offers a new option. Using the features of DOS (especially its batch files), a RAM disk, and a macro processor, the authors show how to transform a limping PC into a powerful speedster (and they even include a disk with much of the needed utility software). The text itself is a well-written and lively exposition of countless tips and techniques for enhancing system performance. Its sole defect is the authors' tendency to overly absorb themselves with the nitty-gritty details of using ProKey. But users who are growing tired of bending to the limitations of their computers can easily overlook this flaw as they benefit from a book that is custom-tailored to the needs of the power user.

Appleworks: Boosting Your Business with Integrated Software

Charles Rubin

Microsoft Press, Bellevue, WA, 1985, 304 pages, paper \$16.95

Rubin's credentials as an Apple aficionado were established with the publication of his customizing handbook, *The Endless Apple*. Just as that book focused on pushing the hardware to its limits, this one helps you get the most out of Apple's integrated spreadsheet/word processor/database package. The book is divided into four main sections: a functional overview of Appleworks, data movement from within applications, an application example section, and finally, some technical tips and techniques. Since Rubin has written his book primarily for experienced Appleworks users, his functional overviews focus on more advanced topics like the two-way exchange of

data between ASCII and DIF files. Operational tips and techniques are reinforced in a series of personal and business applications, ranging from a tax ledger to an integrated employee/customer/product "information base." Rubin is at his best, however, when viewing Appleworks from the inside out, commenting on methods for limiting disk accesses, coping with interface cards, and organizing files for maximum performance. Rupert Lissner, the creator of Appleworks, states in the book's foreword that even he learned a few things from Rubin's treatment.

The Lotus Guide to Jazz In Business

Lotus Development Corp.
Addison-Wesley, Reading, MA,
1985, 360 pages, paper \$19.95

In the first volume on Jazz in the Lotus Learning Series, Lotus forgoes the now standard tutorial/reference manual in favor of some hand-holding. The book takes the reader step by step through the develop-

ment of a wide range of business-related applications, from memos and form letters to pro forma income statements and break-even analyses. In the process, each of Jazz's integrated modules is covered to varying degrees. But paradoxically, users with at least some sense of how to use Jazz will most benefit from this approach, for novices will be frustrated by the book's failure to instill a generalized working knowledge of Jazz. But the variety of flexible and more or less sophisticated examples will help the initiated user make the fullest use of Jazz.

Framework: Introduction to Programming

Forefront Corporation
Ashton-Tate, Culver City, CA,
1985, 234 pages, paper \$24.95

One of Framework's best features is FRED, its own full-featured programming language. One of the best features of this book, written by members of the company that originally developed FRED for Ashton-

Tate, is the way that the integration of application program (Framework) and programming language (FRED) is treated: in an Escher-like conundrum, Framework's outlining feature is used to write and structure the elements of FRED programs, which are then in turn used to customize and enhance the original Framework package. The authors deftly navigate the introductory topics required for this feat, first providing a brief refresher of the Framework environment and then slowly introducing FRED functions and syntax. Despite the introductory limits of the book, the authors do include brief discussions of advanced topics like the creation of FRED macros. Every Framework user who has not yet peeked "under the covers" would do well to learn a few of the basic lessons of this FRED tutorial.

—MIKE NICITA & RON PETRUSHA

Mike Nicita and Ron Petrusha are coauthors of *The Reader's Guide to Microcomputer Books*, 2nd ed. (Golden-Lee, 1984).

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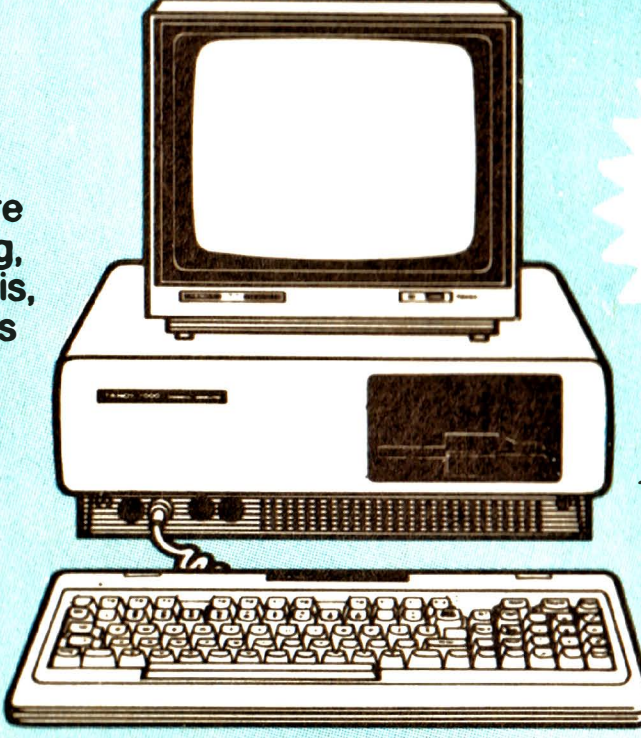
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FOR THE PAST SIX YEARS, OUR OFFICE has used CPT dedicated word processors with a great deal of satisfaction. We're also using personal computers and want to translate the CPT disk information to Symphony and Multimate. Can you tell us how?

—ROBERT KUNES
ANDERSON, SC

YES. YOU CAN TRANSFER FILES BETWEEN computers in several ways. Perhaps the simplest, if the computers are close together and each has an RS-232C serial port, is a cable connection. Otherwise, you can connect a modem to each serial port and send the data over the phone lines. The first method is preferable because it is faster; the phone lines usually limit reliable transmission speed to about 1200 baud.

In either case, you'll need software: specifically, a general-purpose communications program. Popular packages include PC Talk III from Headlands Press, POB 862, Tiburon, CA 94920, (415) 435-0770; Smartcom II from Hayes Microcomputer Products, POB 105203, Atlanta, GA 30348, (404) 449-8791; and Crosstalk XVI from Microstuf, 1000 Holcomb Woods Parkway, Roswell, GA 30076, (404) 998-3998.

You also can have one computer read the disk of another. Xeno-Copy from Vertex Systems (6022 West Pico Blvd., Suite 3, Los Angeles, CA 90035, 213-938-0857) reads and transfers more than 70 formats to PC/MS-DOS disks. Port-A-Soft (POB 1685, Orem, UT 84057, 801-226-6704) sells software and hardware for file transfer between more than 400 computers and word processors.

Finally, you can have the data transferred for you. DisCopyLabs (Suite 10, 1600 Wyatt Dr., Santa Clara, CA 95054, 408-988-0438), Data

Conversion Laboratory (M. J. Gross & Company, 67-27 168 St., Fresh Meadows, NY 11365, 718-939-4921), and Text Sciences Corp. (Suite 1050, 2716 Ocean Park Blvd., Santa Monica, CA 90405, 213-452-9114) all can help.

For more information, see "The Fine Art of Data Transfer" in our September 1985 issue.

DO TWO SURGE PROTECTORS IN THE AC line give greater protection than one?

—YICKMAN WONG
NEW YORK, NY

IT DEPENDS ON THE TYPE. THE SIMPLEST transient overvoltage protector is little more than a plug-in socket containing a metal-oxide varistor (MOV) or equivalent that conducts, or "clips," voltages above a pre-designed value. The energy rating of the MOV determines the amount of power it will absorb before failure. More sophisticated and expensive transient protectors contain three MOVs to handle line-to-line and line-to-ground transients. They react quicker and handle larger spikes and surges. However, filtering the AC line through two or more of these devices offers little more than the capacity to absorb longer transients without failure. This additional capability is of little value.

Some power line filters reduce electromagnetic and radio frequency interference (EMI and RFI) with tuned inductive and capacitive devices. Putting such filters in series increases their effectiveness, giving additional attenuation of unwanted signals. Placing an EMI/RFI filter ahead of the transient suppressor is also a good idea; this decreases the load on the transient suppressor and can prolong its life.

A circuit breaker or fuse protects against excessive current. There's

nothing to gain by placing two in series, because the same current will flow through each.

I HAVE NOTICED THAT MICROSOFT BASIC is not capable of producing true sprite motion for graphics on the IBM PC. Do any books cover this topic?

—PHILLIP CHENG
WAYNE, NJ

A SPRITE IS A GROUP OF PICTURE elements (pixels) that are treated as a single object and can be controlled as one. The "true sprite motion" you mention is usually handled by hardware. A Video Display Processor chip typically defines 32 unique planes, each having its own sprite. These planes can be thought of as 32 pieces of glass, stacked one behind the other. Each plane has a relative priority with respect to the others. Objects in motion will thus pass in front of or behind other objects, depending on this priority.

This is a relatively simple procedure with hardware but quite complex with software because it must establish sprite intersections and redraw the screen in accordance with their assigned priorities.

Books describing graphics programming on the IBM PC include *Interactive Microcomputer Graphics* by Chan S. Park and *Microcomputer Graphics for the IBM PC* by Roy E. Myers (both published by Addison-Wesley, \$36.95 and \$14.38); *Microcomputer Displays, Graphics, and Animation* by Bruce Artwick (Prentice-Hall, \$18.95); and *Graphics Primer for the IBM PC* by Jonathan Sachs and Mitchell Waite (Osborne/McGraw-Hill, \$21.95).

Ask Popular is a monthly column conducted by contributing editors Harv Weiner and Steve Ciarcia to answer general questions about small computers. Send your questions to: Ask Popular, POB 397, Hancock, NH 03449.

NEW PRODUCTS

A portable with a plotter, dBASE enhancers, and other noteworthy items

Hardware



Notebook portable: Designed for the executive on the go, the PC-2500 weighs less than 3 pounds and features a full-size keyboard, a 4-color printer/plotter, and a 4-line by 24-column liquid crystal display for text and graphics. Ni-cad batteries operate about 100 hours between charges, and you can expand the 5K bytes of memory with optional 8K- or 16K-byte RAM cards. Includes cassette interface and serial I/O port; \$395. *Sharp Electronics Corp., Systems Division, 10 Sharp Plaza, Paramus, NJ 07652; (201) 265-5600. [INQUIRY 200]*

Automatic auditing: With the PC/Audit board, your computer allocates system use to any of 256 accounts, providing an audit trail of computer time for job costing or client billing. It also logs individual operator time and requires authorized passwords to boot the computer. The battery-backed 16K-bytes of memory store about a month of data before transfer to disk; you also can transfer to your spreadsheet for further analysis. The half-size board, which includes a real-time clock and calendar, plugs into the IBM PC, XT, and compatibles; \$239. *Bay Computer Inc., Building 4, 3rd Floor, York and Haverhill Streets, Andover, MA 01810; (617) 470-3748. [INQUIRY 201]*

Communications translator: The PCT-100 reduces equipment incompatibility in communications networks. Inserted in-line, it translates RS-232 protocol and data between a terminal and a variety of systems; \$495. *Method Systems Inc., 3511 Lost Nation Rd., Willoughby, OH 44094; (216) 942-2100. [INQUIRY 202]*

Quick color slides: In just a few minutes, you can have a color slide of your computer display with Kodak's Instagraphic CRT slide imager. A typical kit, which includes hood, screen adapter, and easy-to-use camera module, costs about \$500. The cost per slide is \$1.30. A print imaging kit also is available. *Eastman Kodak Co., 343 State St., Rochester, NY 14650; (716) 724-3169. [INQUIRY 203]*

Color monitor: The 13-inch Amdek Color 722 has an etched nonglare screen and fully supports the IBM enhanced graphics adapter and compatible video driver boards. At a resolution of 620 by 350 pixels, it displays up to 16 colors from a 64-color palette. A front-panel switch selects white, green, or amber text; \$799. *Amdek Corp., 2201 Lively Blvd., Elk Grove Village, IL 60007; (312) 595-6890. [INQUIRY 204]*

Versatile printer: The NEC PC-PR105A prints 7 by 7 dot-matrix draft-quality characters at 110 cps and 13 by 9 near-letter-quality characters, with true descenders, at 46 cps. It's compatible with IBM and Lotus 1-2-3 graphics and emulates the Epson FX-80 to accommodate virtually all major software programs. The 15-pound printer, 14 inches wide and 10 inches deep, comes with tractor feed and also accepts cut sheets up to 10 inches wide. For IBM and Apple; \$499.

NEC Home Electronics Inc., Personal Computer Division, Suite 10, 700 Nicholas Blvd., Elk Grove Village, IL 60007; (312) 228-5900. [INQUIRY 205]

Efficient keyboard: You'll get 33 additional keys on your IBM PC or compatible with the Multimate Business Advantage keyboard. The layout enhances operation of Multimate and other business software; \$345. Also available with word processor and Wang-compatible communications board. *Multimate International Corp., 52 Oakland Ave. N., East Hartford, CT 06108; (203) 522-2116. [INQUIRY 206]*

Economical copy: The Legend 808 prints bidirectionally at 100 cps draft and 50 cps near-letter quality. The print head, with a nine-wire square-dot matrix, is guaranteed for life. Includes bit-image graphics and 95 ASCII characters and comes with standard parallel interface, friction and tractor feed; \$199. *Cal-Abco, 6041 Variel Ave., Woodland Hills, CA 91367; (818) 704-9100. [INQUIRY 207]*

Printed transparencies: With Data/View film and your laser printer, you can create 8½- by 11-inch transparencies ready for projection. The film produces images from any computer display, including text, graphs, charts, and tables; 80 cents a sheet in boxes of 50. The company also offers films for dot-matrix, thermal, and strike-on printers. *Arkwright Inc., Main St., Fiskeville, RI 02823; (401) 821-1000. [INQUIRY 208]*

Speedy communication: Irma's Fastlink meets Bell standards for 300/1200 baud, but these are its slower modes. It evaluates the telephone connection automatically and

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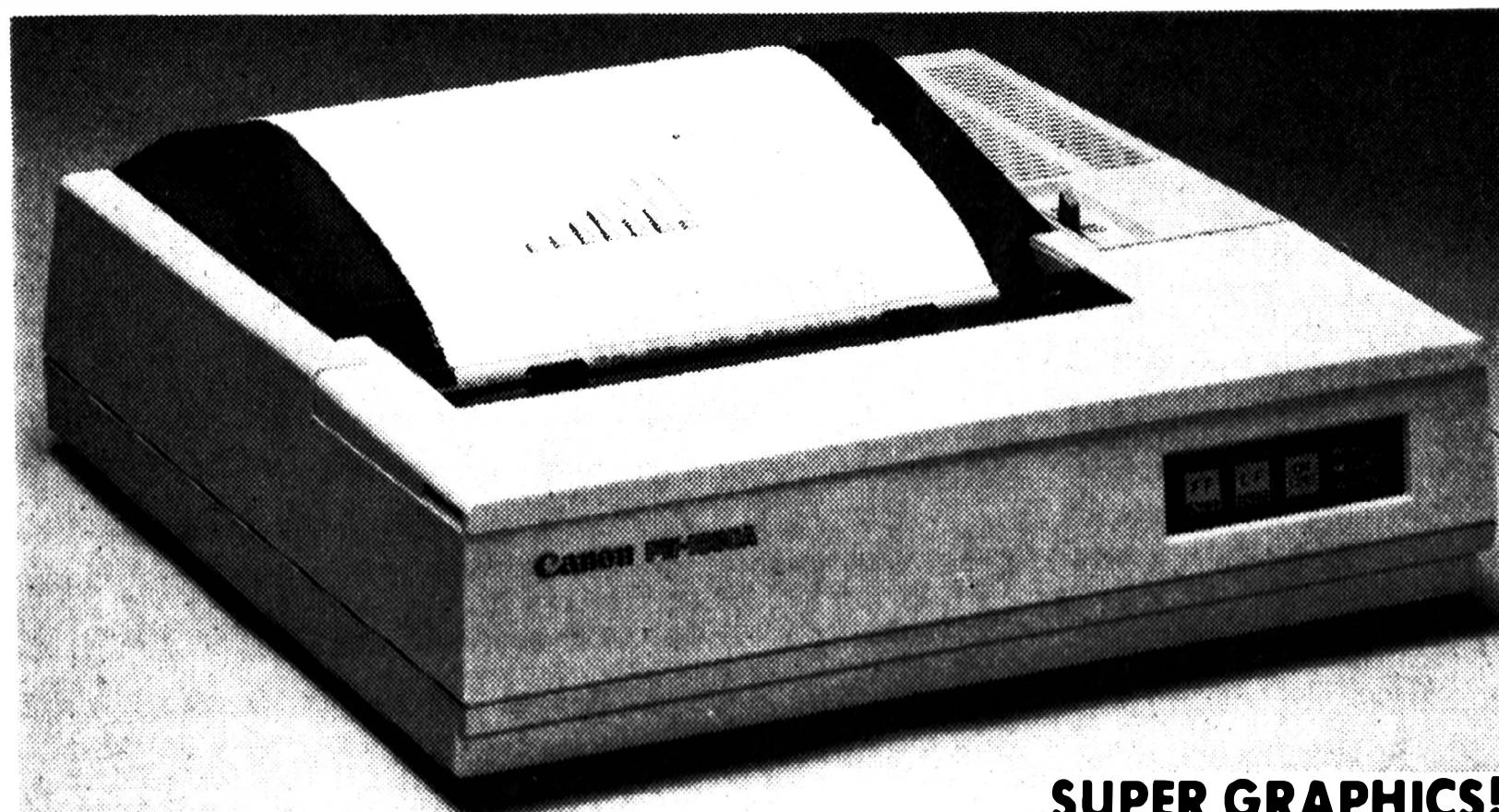
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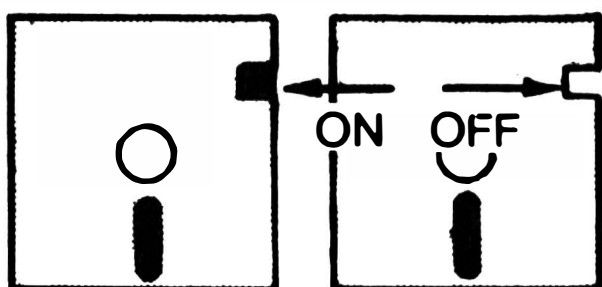
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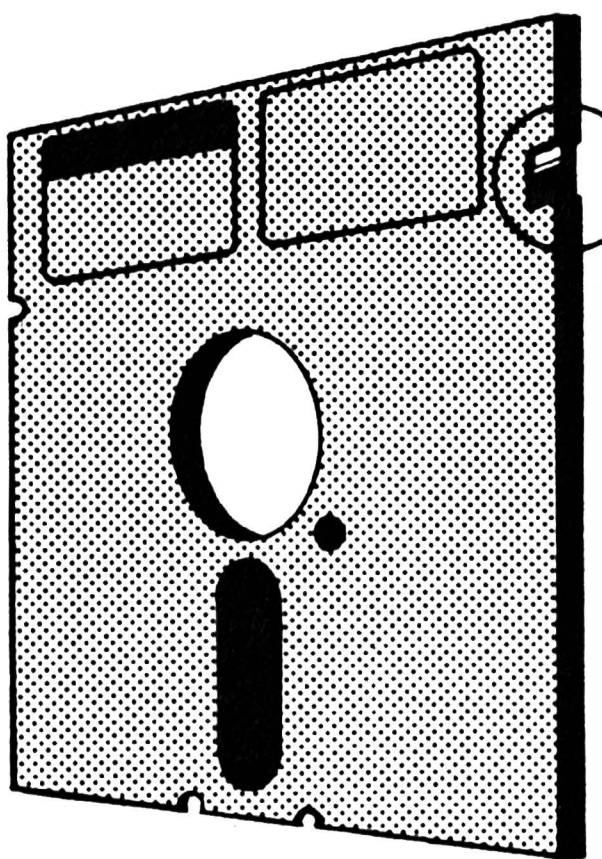
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increases to the fastest rate conditions will permit. It operates to 10,000 baud, depending on line quality. Includes error-checking and a variety of extra features, along with a superset of Hayes Command Language and Crosstalk-Fast software. For the IBM PC, XT, AT, and compatibles; prices start at \$1995. *Digital Communications Associates Inc., 1000 Alderman Dr., Alpharetta, GA 30201. (404) 442-4000. [INQUIRY 209]*

Modular modem: Designed for the user who may want to upgrade later, the basic Quadmodem II operates at 300/1200 baud. You can add 2400 baud by snapping in a new board. The modem supports pulse and Touch-Tone dialing and three call/answer modes. Other features include auto-dial, dial by name, redial busy number, and redial last number. Packaged with telephone cord and Crosstalk XVI. For the IBM PC, XT, AT, and compatibles; \$495. With 2400 baud; \$795. *Quadram Corp., 4355 International Blvd., Norcross, Ga. 30093; (404) 923-6666. [INQUIRY 210]*

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Color printouts: With ColorScreen-Print, you press only two keys to print the color image on your display. The program will print up to 16 predefined colors or black-and-white patterns. It supports 50 printers and all popular color-graphics cards and applications software. For the IBM PC, XT, and AT; \$79.95. *Application Techniques Inc., 10 Lomar Park Dr., Pepperell, MA 01463; (617) 433-5201. [INQUIRY 211]*

Customized graphics: You can illustrate your reports, charts, newsletters, and correspondence with the Mac Art Dept. The program comes with 150 predesigned graphics and the capability to create others. The manual includes tips on mixing graphics and text. For the Apple Macintosh; \$39.95. *Simon and Schuster, Electronic Publishing Group, 1230 Avenue of the Americas, New York, NY 10020; (212) 245-6400. [INQUIRY 212]*

Faster dBASE III: The dBIICompiler is designed to run applications faster than the dBASE III interpreter, make your files more compact, and protect your program source code. It handles files from both dBASE II and III with no format conversion. For the IBM PC, with cross linkers available for most MS-DOS machines; \$750. *Wordtech Systems, POB 1747, Orinda, CA 94563; (415) 254-0900. [INQUIRY 213]*

Time and billing: An interactive, menu-driven program that is easily customized, dProfessional records, analyzes, and reports billable employee time. It organizes data by employee, client, project, service, or a combination. Other features include transaction analysis, billing analysis, cash receipts register, accounts receivable aging, and work in progress. For any system running dBASE II or III; \$395. *SBT Corp., Three Harbor Dr., Sausalito, CA 94965; (415) 331-9900. [INQUIRY 214]*

Search and retrieval: With the touch of a key, In-sight adds file searching, linking, and retrieval to your word processor. It eliminates time-consuming directory searches; finds and links files by words, ideas, projects, and dates as well as name. Integrates with eight popular word processors on the IBM PC and compatibles; \$95. *Pearlsoft, POB 638, Wilsonville, OR 97070; (503) 682-3636. [INQUIRY 215]*

Information management: Clear-Cut, a menu-driven program with on-line help, combines file and data management with a report generator. It creates complex forms and reports, restructures and merges file data. It handles unlimited files with 65,000 records per file and 512 fields per record. For the IBM PC and compatibles; \$54. *Menlosoft, 5 Cheryl Place, Menlo Park, CA 94025; (415) 326-7285. [INQUIRY 216]*

Ledger for the Mac: General Ledger is a true double-entry accounting system for the 128K Macintosh with a single disk drive. Features include variable report formats, customized account charts, and budget control; \$145. *Palantir*

Software, Suite 100, 12777 Jones Rd., Houston, TX 77070; (800) 368-3797. [INQUIRY 217]

Data security: InfoLok protects your sensitive data in four ways: encryption/decryption, file purging, teleformatting, and file hiding/finding. It uses passkeys up to 64 characters and encodes/decodes files in just a few seconds. For all PC-DOS and MS-DOS systems; \$149. *Info-code Inc., 19 Union Square West, New York, NY 10003; (212) 741-9411. [INQUIRY 218]*

Easy word processing: Einstein-Writer comes with a 65,000-word speller, single-keystroke commands, automatic formatting, split-screen mode, and many other features. It supports 90 printers, including new laser models. For the IBM PC, XT, AT, PCjr, and compatibles; \$169.95. *United Software Industries Inc., 1880 Century Park East, Los Angeles, CA 90067; (213) 556-2211. [INQUIRY 219]*

Handy utility: Onelook includes modules for keyboard enhancement, macros, calculator, notepad, auto-dialer, address file, and password security. You also can automatically load function-key templates for such programs as Lotus's 1-2-3, Symphony, Framework, Multimate, and WordStar. For IBM PC, XT, AT, PCjr, and compatibles; \$139. *IMSI Software Publishers, 1299 Fourth St., San Rafael, CA 94901; (415) 454-7101. [INQUIRY 220]*

File backup: Designed for larger companies with numerous IBM PCs or compatibles, TakeTwo is a fast and easy floppy-disk backup system for hard-disk data. Automatically backs up files that have been added or changed during the day; \$1400 annually for on-site licensing. *United Software Security Inc., Suite 100, 6867 Elm St., McLean, VA 22101; (703) 556-0007. [INQUIRY 221]*

New Products provides up-to-date information on recent releases of microcomputer hardware, software, and accessories. Descriptions are based on information supplied by the manufacturers and should not be considered endorsements. If you need additional information, please check your local dealers or write directly to the manufacturers.

Continued from page 60—

the general public, often can point to someone who does.

A qualified in-house searcher, on the other hand, can usually get the information faster and sometimes cheaper, is more sensitive to your business's information needs, and is more likely to be trustworthy with confidential search topics. You don't need to hire a professional; anyone can learn basic search skills in a short time from written instructions, use of free or reduced-cost "practice" databases, or attendance at seminars offered by nearly all database vendors.

An increasingly common corporate practice is to give managers and executives direct access to databases. Keiser says a half-dozen Penn Central executives routinely do their own searches for information. As they become familiar with the databases, they learn to vary their search requests to gather other valuable information. "When you look for one thing, you may find six other related items," Keiser adds.

Middle managers are often better equipped than top executives to assess information needs, observes Prendergast at Chicago Public Library. "It's executive secretaries and account executives who understand how to use these things in the most efficient way," she says.

Keeping Costs Down

Judicious management of a data resource center can keep your costs to a minimum. For starters, use original paper sources when they will do: it makes little sense to pay \$1.67 a minute to look up a company in the on-line version of D&B's *Million Dollar Directory* when there's a print copy sitting nearby. But if you need a listing of all Massachusetts shoe companies with million-dollar-plus sales, then on-line searching is the obvious choice.

Before you make an on-line search, draw up a careful written search plan to cut expensive connect time. To plot your search strategy, don't hesitate to call the toll-free numbers of database vendors like Dialog or Nexis or, for even more detailed advice, the actual producers who created the databases (you usually can

obtain the phone numbers from the vendors).

Some on-line services will help you refine your strategy. Dialog's Dial-index service, for example, for 58 cents a minute will report how many "hits," or references to a certain topic, occur in a selected set of databases. If the number of hits is overwhelming, you can make your search string more specific. A NewsNet service dubbed "Analyze" provides similar information.

Be aware that full-text databases can be an expensive source of frustration for researchers inundated by "hits." "With full-text databases you pull out far too much and get a lot of garbage," says Sun Co. information specialist Dale Rodenhaver, who considers large databases like Nexis unwieldy. On the other hand, she says, "I've seen a lot of great abstracts and when someone handed me the full article, I said, 'This isn't what it was about.'" Rodenhaver would prefer to see both abstracts and full text offered, as is the case with certain publications offered through the ASAP service of Magazine Index and the Trade and Industry Index.

As a rule of thumb, bibliographic databases should suffice if you need only general background information and don't need it urgently. Abstracts like those in ABI/Inform often contain enough information to make it unnecessary to obtain the full text, which might take several days for delivery.

Standard Industrial Classification (SIC) codes are a considerable help in narrowing searches of some manufacturing industries. These seven-digit numbers, obtained from the Census Bureau's Numerical List of Manufactured Products, are available at many libraries. The codes can be used at any one of seven levels of specificity to search for articles about a particular industry. One code, for example, represents Christmas cards sold at counters; another represents packaged Christmas cards only. Among the databases that link SIC codes to articles are Dun's Market Identifiers, Industry Data Sources, the Trade and Industry Index, and PTS F&S Indexes.

As a general rule, the faster your

modem, the cheaper the information. Dialog and Vu/Text charge the same for 300-baud transmission as they do for the four-times-faster 1200-baud rate. News/Retrieval and NewsNet charge double, still a savings unless sluggish response time or searcher clumsiness wastes precious minutes, which can cost \$5 each. Many databases are adapting to 2400-baud rates, sometimes at the same price as 1200-baud.

As previously noted, use of such after-hours services as Knowledge Index can result in a 300 percent discount over Dialog rates. Other databases offer off-hour savings in the 25 percent to 50 percent range. Experienced researchers economize still more by using Knowledge Index to find titles of key articles, then pulling them up on a full-text database or finding the original paper versions in a library.

What's Ahead

Advances in storage, processing, and transmission technology will mean cheaper and faster on-line databases in the future. The number of databases can be expected to proliferate, but so too can the number of gateway services such as EasyNet or Business Computer Network, both designed to make access easier and bring uniformity to the mind-boggling welter of search commands.

Also, some relatively static data is already available on 4.72-inch compact laser disks, each of which can hold as much data as is contained in 540 copies of the Bible. Compact laser disks can be searched word by word by a personal computer equipped with a laser reader costing \$2000 to \$3000. Hardware prices are dropping rapidly, too. With the advances being made in laser-disk technology, you will soon be able to set up your own in-house reference database, which if used frequently would justify the added equipment expense by eliminating hefty connect-time charges.

Experts predict this sort of integration of in-house and external database resources for the near future. However the technology develops, computers are certainly leading the way in keeping businesses well informed. □

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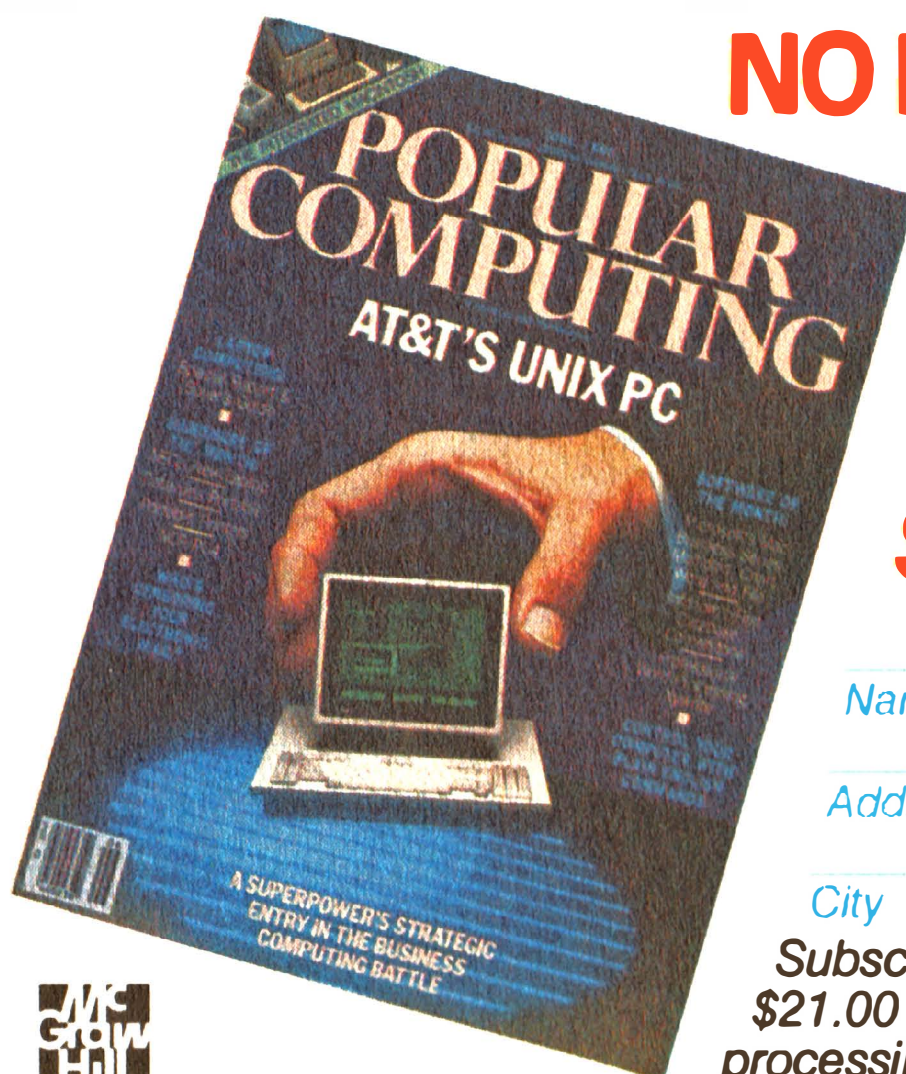
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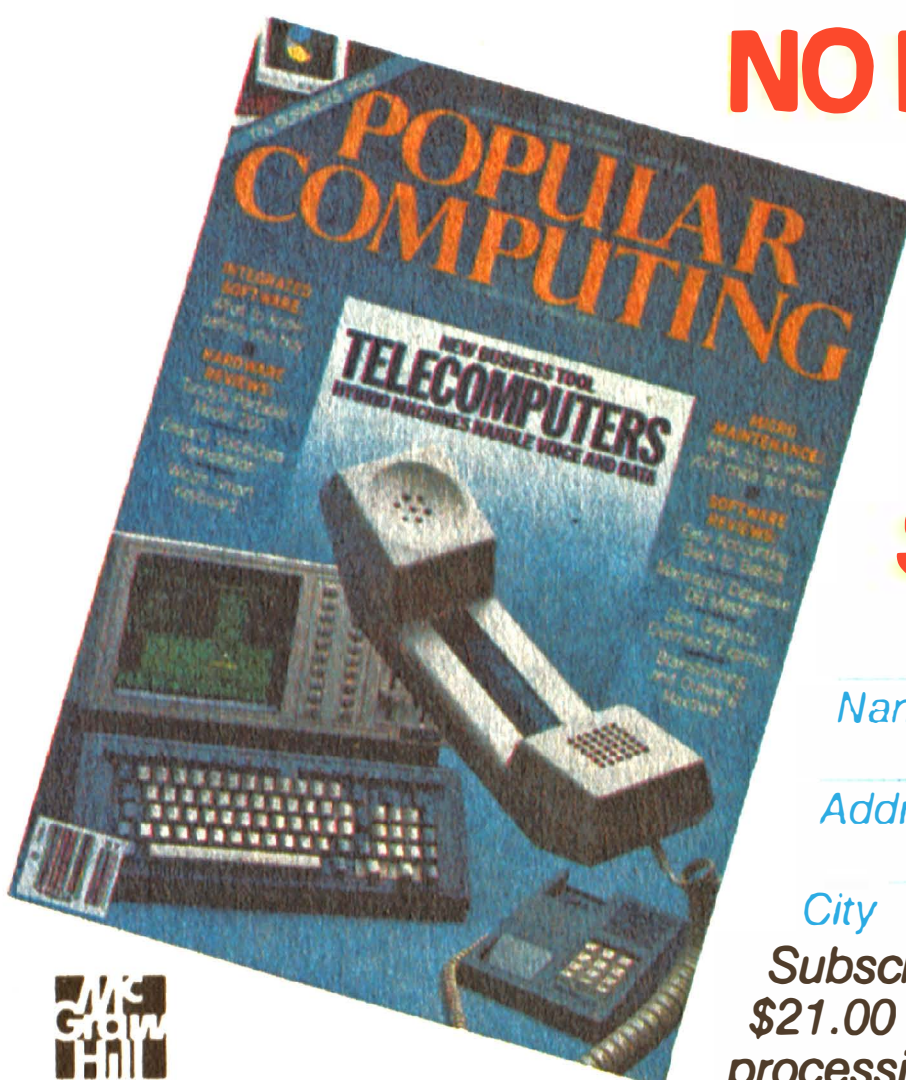
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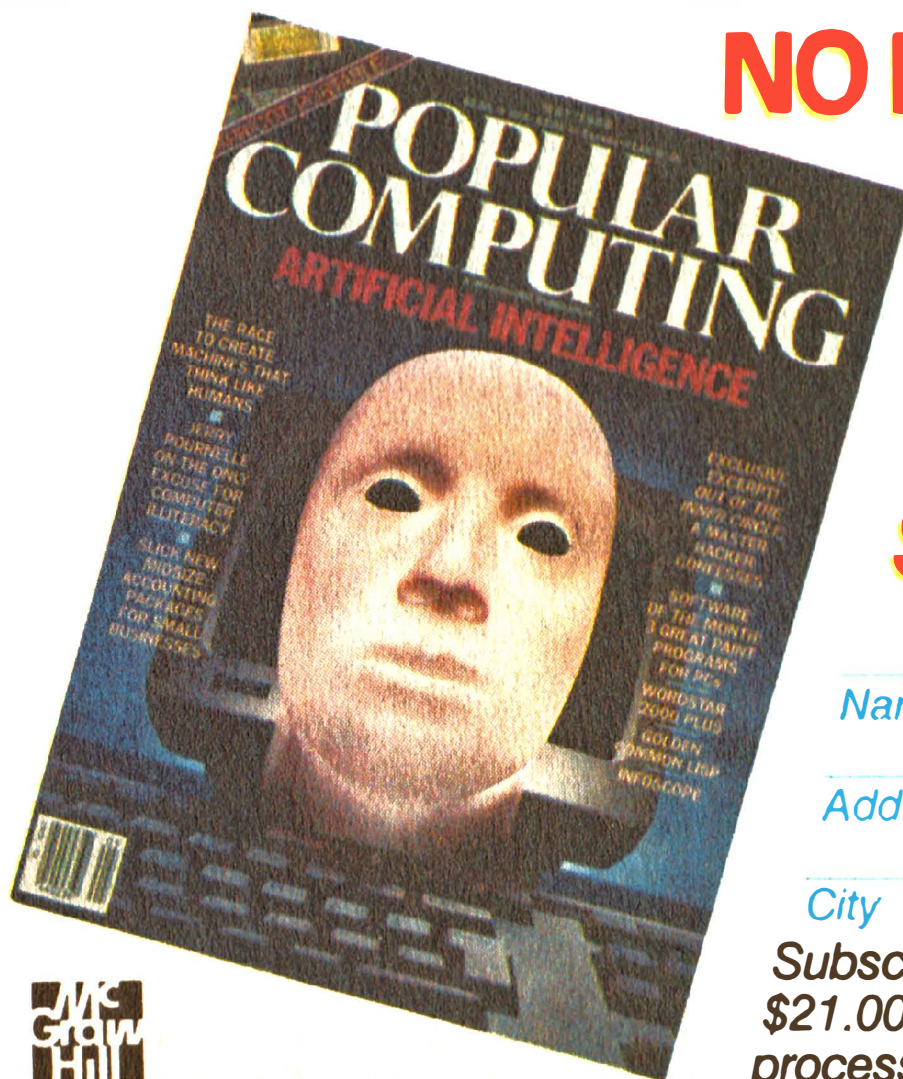
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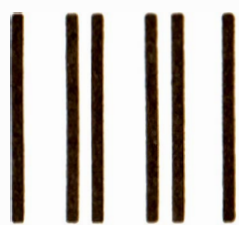
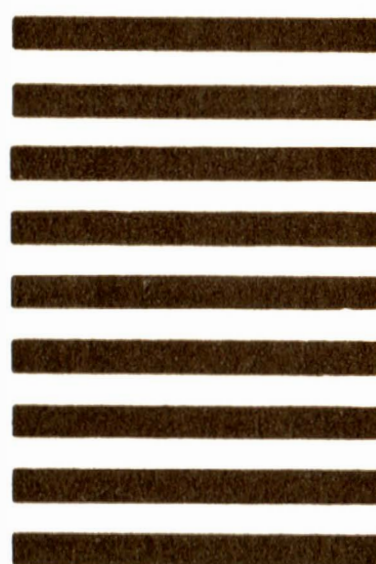
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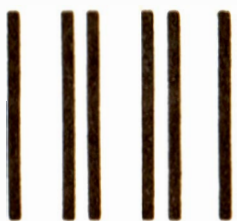
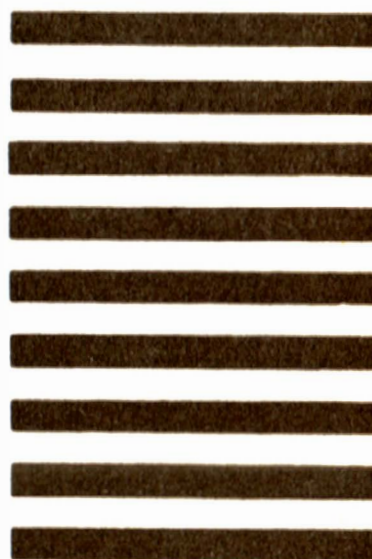
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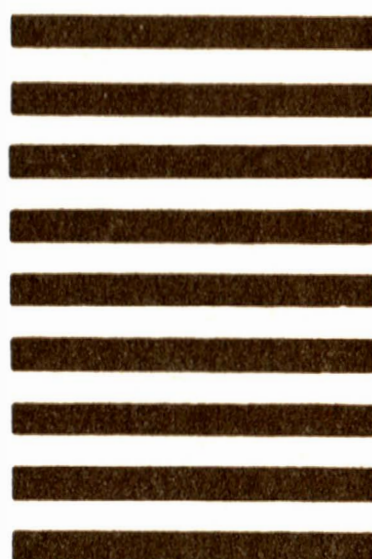
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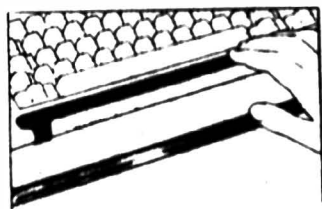
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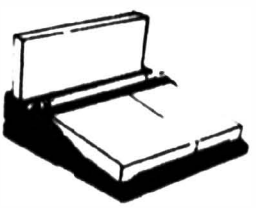
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GETTING MORE FROM DOS

Continued from page 63—

TREE C:/F [CTRL]P [RETURN]. When the printing stops, type [CTRL]P.

You also can make things easier for yourself by organizing your files logically, using obvious, clear names, and tidying up from time to time by removing unneeded subdirectories. RD is the command to "remove directory," but a directory must be cleared of all files before it can be removed. Here's how:

To erase LETTERS from the root, for example, enter the subdirectory by typing CD \WRITING\LETTERS. Next, erase all the files in it with ERASE *.* . Your computer will respond, "Are you sure? (Y/N)." Type Y [RETURN]. The subdirectory is now empty and can be erased, but you must first get out of the directory to erase it. Move back one level to WRITING by typing CD \WRITING then type RD LETTERS. (Note: as a shortcut, you can simply type "CD .." to move up one level without specifying the target subdirectory's name.)

Despite the tremendous organizational advantages of subdirectories, only some software takes full advantage of them. In newer, powerful programs like Symphony, for example, you can load and save using pathnames to access files hidden in a thicket of subdirectories. Unfortunately, other popular programs such as WordStar don't allow such flexibility. Nevertheless, you can still create branches from your WordStar subdirectory to hold retired and seldom-used files. If they're needed, though, you'd have to copy them back into the subdirectory.

Beyond Subdirectories

After a while, you'll tire of repeatedly and routinely typing DOS commands to access your subdirectories. The solution is batch files—simple text files you can write to guide DOS automatically through a consecutive series (a "batch") of commands. Batch files also allow others to use your subdirectory structure without their having to learn new commands and without your having to play DOS instructor. But batch files do more than help you organize files—they can automate virtually any DOS task. We'll examine these versatile files in depth next month. □

UPGRADING YOUR BUSINESS GRAPHICS

Continued from page 56—

ipherals available in today's market.

Mirage has virtually unlimited input, database query, and charting features, along with a full range of output capabilities. It includes a graphics editor (formerly a separate module called Ego) that can move or modify images and create free-form artwork. Autumn, a library of over 100 chart and graph types, also includes a graphics editor. VR (for virtual rasterizer) is an interface module that accesses graphics from programs such as Lotus's 1-2-3 and makes them available for alteration by either Mirage or Autumn.

The complete Zenographics package requires skill and patience to set up, but once it's properly installed, the modules are glitch-free and easy to use. Program features seem endless—typefaces, for instance, come in eight styles with unlimited sizes and can be kerned or justified. You also get graphics primitives such as arcs, arrows, circles, lines, polygons, rectangles, splines, and windows—together with working features such as fills, freehand drawing, "snap-to" grids, zoom, pan, and digitizing tablet support. You make selections from screen menus. All this flexibility, however, is at the expense of ease of installation. Still, for the widest range of applications and system configurations, Zenographics is the business graphics software of choice.

PC-SLIDE COMES IN THREE versions (50, 100, and 200) from Management Graphics to give you software for everything from creating excellent basic business graphics to setting up your own slide production service. Management Graphics started seven years ago as a service bureau and developed the Dial-A-Slide service in Canada in 1981. The company can prepare presentation-quality slides from data that you prepare with PC-Slide and transmit on a disk or by modem.

In addition, both PC-Slide/100 and PC-Slide/200 directly support the HP 7510 and the Matrix PCR and QCR film-recording cameras. This means that you can upgrade from an in-house graphing system that relies on Dial-A-Slide for presentation slides to a completely in-house pro-

duction system when you're able to afford a film-recording camera—all without ever having to learn new software procedures.

PC-Slide is supported by excellent documentation. The Getting Started section of the manual consists of a series of "what if" questions that lead you through procedures for setting up the program on your hardware. The Tutorial section covers pie and bar charts and line graphs from program setup to saving your finished image, and a Reference section describes each command. You'll even find instructions for using the Dial-A-Slide service and for making presentation-quality slides with your own film-recording camera.

PC-Slide features a Draw module that lets you create circles, boxes, lines, or polygons and then scale, copy, or move them globally. The PC-Slide display has been limited to a 320 by 200 resolution, but by press time, a 640 by 400 version should be on the market. Sixty-four colors are available, together with four fonts in 13 different sizes. To speed up the design process, standard images like maps and drawing elements are supplied on disk.

The most noteworthy feature about PC-Slide is the parent company's background as a service bureau and its application of this experience to high-volume slide production within a corporate environment. The management/accounting packages available as a part of PC-Slide/200 handle production-related paperwork (work orders, invoices, shipping lists, etc.) that other programs described in this article do not address.

In Conclusion

Upgrading your microcomputer hardware and software to create presentation-quality charts and graphs is no trivial endeavor, but the tools available today make it worthwhile and exciting. The ball is now in your court—it's up to you to make a careful analysis of your needs and select software accordingly. The seven programs reviewed here are a good place to start. □

Ken D. Schmeupe is a Senior Writer/Editor at Studio 7 Technical Documentation (San Carlos, CA), a writing, graphics, and consulting business specializing in hardware and software user's guides.



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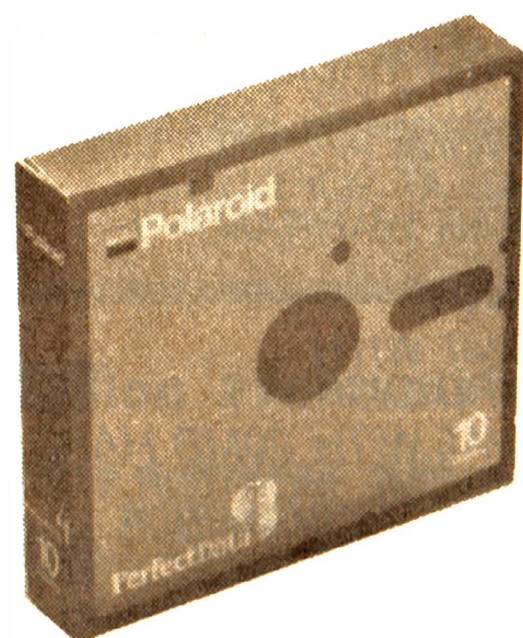
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REACTIONS

A showcase of comments, kudos, outcries, opinions, gripes, and grumblings

Long Live the Model 100

Your review of the Tandy 200 by Thom Hartmann (July 1985, page 82) compares Tandy's new laptop with its predecessor, the portable 100. Earlier in the summer I purchased a portable 100, and I consider myself fortunate.

According to the review, the Model 200 configured with 24K bytes of RAM sells for \$999. I purchased my Model 100 (on sale) for \$299 configured with 8K bytes of RAM. I then ordered three third-party 8K RAM chips at \$33 each, giving me a 32K-byte system for a total cost of about \$400. Additionally, I can address approximately 29K bytes of this RAM at one time as opposed to the 19K bytes available in any of the 24K banks of the Model 200. I can even upgrade this RAM using bank switching.

Obviously, RAM isn't everything, and the Model 200 has some features which are clearly superior to the Model 100. If you have a need for Multiplan or want to do a lot of word processing and have plenty of disposable income, the Model 200 may be the better choice. On the other hand, for people like me who have access to other computers and who view a laptop primarily in terms of its portability, for light-duty word processing and some access of dial-up facilities, the additional \$600 is hard to justify. —RICHARD WRIGHT
MARQUETTE, MI

Micro-Mainframe Links

I found "Micro-to-Mainframe Links" (August 1985, page 71) to be a very informative piece of work. However, I should point out a slight error. Arielle Emmett says, "Asynchronous links are slow, however; and they don't let micros talk to IBM hosts that are locked into SNA/SDLC or Bisync protocols, two pop-

ular IBM mainframe protocols."

I agree that asynchronous links are slow, but it is possible to access an IBM SNA network from a terminal or micro (that emulates a terminal) using an asynchronous link.

There is an IBM software product called NTO (Network Terminal Option) that when added to the control program of a front-end processor (which is also known as a communications control unit or CCU) will cause the control program to convert the asynchronous data received from the terminal (or micro) into SNA protocol.

Also, software is available for the IBM PC that will allow it to "talk" to an IBM host that runs SNA, using a telecommunications line that uses the SDLC or Bisync protocols.

—D. BROWNE
REGINA, SASK.

In "Micro-to-Mainframe Links" Arielle Emmett emphasized products in the 5-digit price category as popular solutions to the dilemma of accessing and utilizing mainframe data in personal computer applications. However, our company offers a \$395 software package, Trio, which takes a "micro-based" software approach that requires no host installation; processing is done on the file after it reaches the microcomputer.

—WILLIAM G. BRUNSWICK
CDI SYSTEMS
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Software Solution?

Can software bail us out of this computer slump? I read Michael Miller's article ("Rekindling the Fire," September 1985, page 53) but believe the answer lies more in hardware. Miller said himself that the last time he saw any great enthusiasm was at the Macworld expo when the Mac, a totally new style of computer, was

still being introduced to the computer world. Computers are still being introduced every day, but are they really new computers? The Amiga and the ST look like enhanced Macintoshes to me. The new AT clones are just IBMs with a couple of new features. Plus a lot of companies are just putting lipstick on their last year's models.

What the computer industry needs is a truly new computer, but I don't know if this can happen now that corporate America has joined in the personal computer game. Let's just hope the big guys handle their new job better in the future than they did this year.

—CHRIS HUGHEN
SELMA, AL

I have noted Michael J. Miller's emphasis on software and could hardly agree with him more. The hardware industry has done a superlative job of developing computers with the storage capacity and speed needed but then has marketed the machines almost as if they were intended to be luxuries and novelties. The firms I deal with need few of the advertised frills. If computers are to become a basic tool of practically every business, and to "sell like hotcakes," then they must be made to become a *necessity* like the telephone, typewriter, etc. And this can be done only with the right kinds of software.

—THOMAS R. RANDALL
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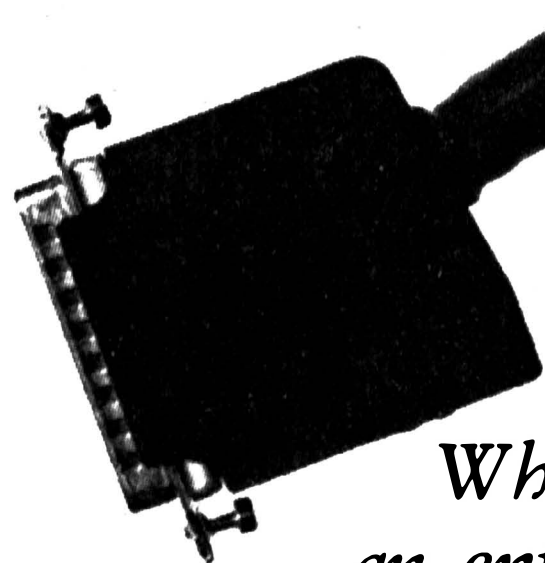
The interface game is a spaghetti Western, no doubt about it. For years standards makers have been trying to bring law and order to the interconnect corral, but manufacturers insist on adapting interface standards to meet their own needs. The result is chaos: devilishly difficult communications between different brands of computers, printers, and modems.

A case in point is RS-232C. Promulgated in 1969 by the Electronic Industries Association (EIA) to provide a short-haul interface for connecting terminals to modems, RS-232C has led a short happy life as the reigning interconnect standard for microcomputers and serial printers.

Yet manufacturers, like *banditos* armed with an edict too loosely worded, have taken liberties with RS-232C. Claiming compatibility, most have actually implemented subsets of the standard's myriad electrical and functional rules, rules that curiously omitted the exact mechanical description of a 25-pin interface connector.

Naturally, omissions have resulted in sins of commission. In some cases, computer manufacturers implement RS-232C using any off-the-wall connector they please. Others simply ignore RS-232C electrical specifications and use the longer-distance specs of RS-422, still calling the interface "RS-232C-compatible."

Whatever the abuse, the result is incompatibilities and headaches for the consumer. Even "standardized" versions of the interface implement only a fraction of the 21 specified RS-232C signals. Many microcomputer manufacturers activate only five or six signals, some eight or nine, some three or four. Because of the flexibility of the EIA standards



*Why we may need
an enforcer to ensure an
interface standard*

document, these manufacturers can still claim "RS-232C" compatibility as long as they maintain the correct signal voltage levels and implement the right function on the correctly assigned pin.

"There are a lot of people implementing interfaces that don't conform to the standard," admitted Fred Lucas, chairman of the EIA Subcommittee TR30.2, which deals with the RS-232C interface. "Why do they do it? I don't have the slightest idea." One explanation is that manufacturers rely on exclusive implementations of communications features to keep customers buying their product lines. No one has given them much flak about that. It's been easier thus far to ignore the interface issue than to decide on an inviolable communications standard that works for everybody. Moreover, interface standards, say Lucas and others, are not enforceable. Standards makers are committee men and women, not the Lone Ranger. Standards themselves never die; they simply transform. But who cares? Manufacturers do their own thing, anyway.

To its credit, the EIA is trying to remedy the situation and bring RS-232C in line with tougher, more complete, international interface standards. Its new revision of the RS-232C interface—called EIA-232D

—will include for the first time an explicit description and diagrams of the 25-pin serial connector, additional specifications for three new interface leads, and rekeying of certain definitions to broaden the applicability of the standard to current equipment requirements.

Subcommittee TR30.2 is also looking into splitting the electrical and physical characteristics of EIA-232D into separate standards, thus giving manufacturers the option of choosing among a limited number of standard physical connectors to meet their equipment needs.

But will EIA's strategies win allegiance from the manufacturers it serves? Or will manufacturers continue to play the same games as before, relying on vagaries of wording and persistent loopholes to achieve their own sense of design economy and, more important, exclusivity? My hunch, unfortunately, is the latter. The record shows us that most manufacturers can't see the forest for the trees. Why not make every one of them adhere to a single RS-232C interface standard, with one connector and only one set of functional, mechanical, and electrical specifications?

Making computers talk through a standard serial interface should be about as simple as plugging a modular phone connector into a wall jack. Waiting for future standardization is like whistling into the wind. It's time we had an enforcer—by law or by consensus—to eliminate the interface pretenders.

—ARIELLE EMMETT

Arielle Emmett is co-author, with David Gabel, of *Direct Connections: How to Get Computers to Talk to Each Other*, a Plume Book to be published by New American Library in 1986.

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The first in-depth, head-to-head reviews of the two new machines that're knocking on the Macintosh's door.

Special Report on Multitasking

If you've ever found yourself having to kill time waiting for your micro to finish a complex job, you need multitasking software, new programs that allow you to load and run several applications at the same time.

Apple II Upgrades

Apple recently announced a line of products that significantly enhance the power of the Apple II and will particularly suit users of the II in business, where ease of operation and high storage capacity are essential.

Getting More From MS-DOS, part two

This month we look at batch files, simple text files you write that instruct the operating system to automatically carry out a consecutive series, or "batch," of commands. They're easy to write and can boost your productivity enormously.

PLUS: reviews of Hewlett-Packard's AT-like Vectra, Leading Edge's phenomenally low-priced PC clone, Microsoft's integrated Excel for the Mac, Teal Communications' sophisticated Around telecommunications package, and much more...

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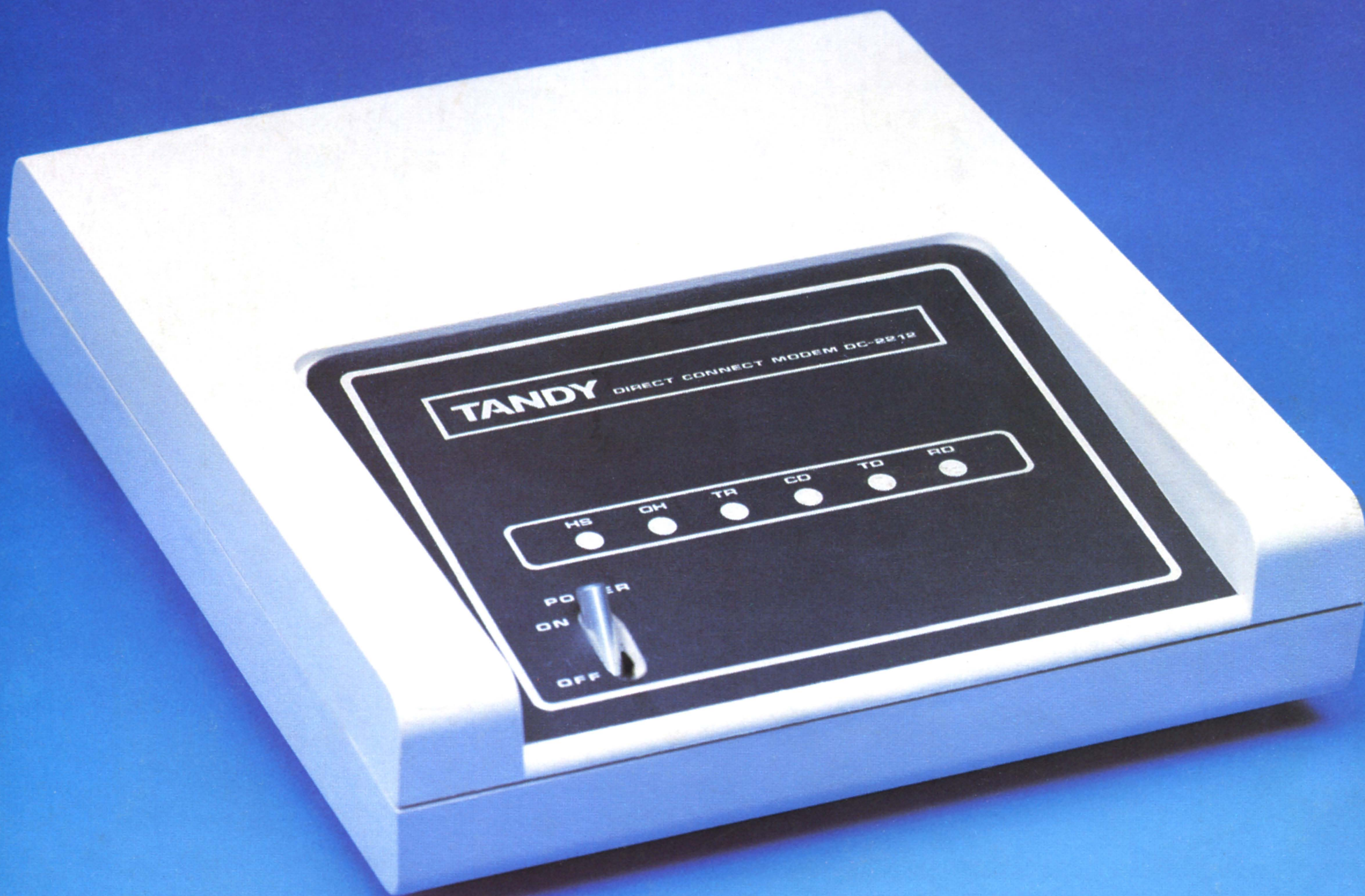
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